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13. ABSTRACT <p>BACKGROUND. Improvements in the conventional strength of Warsaw Pact forces and the increasing costs of modern weapon systems have caused the United States and other NATO countries to renew attempts to achieve greater standardization and interoperability of alliance equipment. Specifically, the US has been actively seeking to identify European weapon systems for direct purchase or cooperative development. President Carter publicly committed the US to this policy in an oft-quoted speech in which he described NATO standardization as a "two way street." Realistically, the policy of more dependence on Europe will be difficult to implement. Efforts to increase purchases from the NATO allies must be tempered with the recognition of consequences on domestic jobs, US balance of payments, and US security.</p> <p>PURPOSE. The purpose of this study was to develop a handbook of lessons learned based on an analysis of selected standardization and interoperability programs, primarily Army, in which the US has participated. It is felt that the problems inherent in achieving standardization can be alleviated to some degree by analyzing and documenting the experiences of past programs. For the most part, the study concentrated on those programs on which the US was dependent on Europe for the technology. This was consistent with the "two way street" philosophy. The objectives were to identify the political, legal, economic and technical problems encountered by the Army and DOD and to develop guidelines for future programs.</p> <p>FINDINGS AND PRESENTATION. The analysis of the selected programs revealed that lessons learned on standardization and interoperability programs are common or duplicative to a significant extent. As a result, the lessons learned have been classified into 13 major subject categories: Public Policy; Program Initiation; Program Management;</p>			

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Memoranda of Understanding; Licensing; Contracts; Technical Considerations; Configuration Management; Quality Assurance; Test & Evaluation; Logistics; and Coproduction. Within each of the major categories, a number of lessons learned has been developed. Included under each lesson learned are related statements which clarify or reinforce the major point. In some instances, other lessons of less magnitude appear.



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NATO STANDARDIZATION
AND
INTEROPERABILITY
HANDBOOK OF LESSONS LEARNED

DECEMBER 1978

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ARMY PROCUREMENT RESEARCH OFFICE

U.S. ARMY LOGISTICS MANAGEMENT CENTER
FORT LEE, VIRGINIA 23801

NATO STANDARDIZATION
AND
INTEROPERABILITY
HANDBOOK OF LESSONS LEARNED

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December 1978

Information and data contained in this document are based on input available at time of preparation. Because the results may be subject to change, this document should not be construed to represent the official position of the US Army Materiel Development and Readiness Command.

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EXECUTIVE SUMMARY

A. BACKGROUND. Improvements in the conventional strength of Warsaw Pact forces and the increasing costs of modern weapon systems have caused the United States (US) and other NATO countries to renew attempts to achieve greater standardization and interoperability of alliance equipment. Specifically, the US has been actively seeking to identify European weapon systems for direct purchase or cooperative development. President Carter publicly committed the US to this policy in an oft-quoted speech in which he described NATO standardization as a "two way street." Realistically, the policy of more dependence on Europe will be difficult to implement. Efforts to increase purchases from the NATO allies must be tempered with the recognition of consequences on domestic jobs, US balance of payments, and US security.

B. PURPOSE. The purpose of this study was to develop a handbook of lessons learned based on an analysis of selected standardization and interoperability programs, primarily Army, in which the US has participated. It is felt that the problems inherent in achieving standardization can be alleviated to some degree by analyzing and documenting the experiences of past programs. For the most part, the study concentrated on those programs on which the US was dependent on Europe for the technology. This was consistent with the "two way street" philosophy. The objectives were to identify the political, legal, economic and technical problems encountered by the Army and DOD and to develop guidelines for future programs.

C. FINDINGS AND PRESENTATION. The analysis of the selected programs revealed that lessons learned on standardization and interoperability programs are common or duplicative to a significant extent. As a result, the lessons learned have been classified into 13 major subject categories: Public Policy; Program Initiation; Program Management; Memoranda of Understanding; Licensing; Contracts; Technical Considerations; Configuration Management; Quality Assurance; Test & Evaluation; Logistics; and Coproduction. Within each of the major categories, a number of lessons learned has been developed. Included under each lesson learned are related statements which clarify or reinforce the major point. In some instances, other lessons of less magnitude appear.

CAVEAT

This study contains a discussion of lessons learned based upon an analysis of problems confronted in selected standardization and interoperability programs. The lessons learned should prove valuable to alert the reader to future problems and possible solutions thereto. However, future problems can only be resolved by adequate technical and legal analysis on a case-by-case basis and lessons learned may not always be applicable to such problems, particularly if the facts, laws, and regulations are different. One further point needs emphasis. Although attempts at NATO cooperation have persisted for three decades, NATO rationalization, standardization and interoperability (RSI) is still for all practical purposes, a relatively new and dynamic field. Ground is still being broken on the best way to accomplish the objectives of NATO standardization and interoperability. Project managers are encouraged to try innovative and ingenious methods. Originality and flexibility may be especially appropriate for negotiation of Memoranda of Understanding (MOU's), licensing agreements, contracts, and RSI plans.

TABLE OF CONTENTS

	PAGE
EXECUTIVE SUMMARY.	iii
CAVEAT	iv
LIST OF FIGURES.	vi
CHAPTER	
I. INTRODUCTION	1
A. Background	1
B. Purpose and Objectives	2
C. Methodology.	3
D. Definition of Terms.	4
E. Alternative Means of Accomplishing NATO Standardization and Interoperability	7
F. Organization and Presentation.	10
II. LESSONS LEARNED.	12
A. Orientation.	12
B. Categorization of Lessons Learned.	12
C. Format of Presentation of Lessons Learned.	13
D. Catalog of Lessons Learned and Detailed Narratives	13
III. RECOMMENDATIONS.	186
A. Introduction	186
B. Recommendations.	186
APPENDICES	
A. GLOSSARY OF ACRONYMS AND ABBREVIATIONS	A-1
B. SELECTED BIBLIOGRAPHY.	B-1
C. STUDY TEAM COMPOSITION	C-1

LIST OF FIGURES

FIGURE	PAGE
1 ORGANIZATION CHART FOR AN RSI PROJECT OFFICE	34
2 PRINCIPAL DOD/DA ELEMENTS DEALING WITH NATO RSI	41
3 ORGANIZATION FOR STANDARDIZATION WITHIN NATO	43
4 MOU EVOLUTION PROCESS	45
5 US/EUROPEAN COORDINATION STRUCTURE	52
6 DRAWING CONVENTIONS	125
7 PROCEDURE FOR PROCESSING ENGINEERING CHANGE PROPOSALS (ECPs) TO I ² ITEMS	136

CHAPTER I

INTRODUCTION

A. Background.

Standardization and interoperability have been North Atlantic Treaty Organization (NATO) objectives since the alliance was formed in 1949. Nevertheless, a variety of obstacles - political, cultural, economic, technical and military - has prevented achievement of acceptable levels of NATO standardization and interoperability. Improvements in the conventional strength of Warsaw Pact forces and the increasing costs of modern weapon systems have motivated the United States (US) and other NATO countries to make a fresh start toward accomplishment of these objectives.

Both the executive and legislative branches of the US Government support the attainment of standardization and interoperability among NATO forces. In fostering the goal of increased commonality of equipment, the US has been actively seeking to identify weapon systems for either direct purchase from another NATO country or cooperative development. President Carter publicly committed the US to more foreign acquisitions in an oft-quoted speech in which he described NATO standardization as a "two way street." In an interview reported in the Armed Forces Journal of July 1978 (page 32), the Under Secretary of Defense for Research and Engineering stated that the Europeans have forced the US into a shift toward more acquisitions from NATO countries. The estimated 10 to 1 balance of military purchases in favor of the US is no longer acceptable to European governments or industry. The Under Secretary explained that given there was going to be a change, the US must try to influence the change "in such

a way that what results are cooperative programs that are brought in with reasonable costs and maximum effectiveness of the resulting systems."

Realistically, the policy of more dependence on Europe will be difficult to implement. Efforts to increase purchases from the NATO allies must be tempered with the recognition of consequences on domestic jobs, US balance of payments, and US security. Additionally, introducing foreign equipment and foreign technology poses special problems for the logisticians of the Department of Defense.

It is felt that the problems inherent in achieving NATO standardization and interoperability can be alleviated, to some extent, by analyzing and documenting the lessons learned on past cooperative programs. Although the number of applicable programs is limited, some of the programs are recent or ongoing and a large number of beneficial experiences have been gleaned.

B. Purpose and Objectives.

1. Purpose. The purpose of the study is to develop a handbook of lessons learned based on an analysis of key standardization and interoperability programs in which the United States has participated.

2. Objectives. The specific study objectives were to:

a. Identify the political, legal, economic, and technical problems encountered by DOD and the Army in seeking NATO standardization and interoperability in direct purchase, coproduction, licensing, and in joint, interdependent, and competitive research and development (R&D) programs.

b. Determine the effects of the foregoing problems on the negotiation and fulfillment of international programs from the earliest stages

of negotiation through the later periods of maintenance, repair, and supply of parts.

3. Tasks. The key tasks that related to the objectives were to:

- a. Analyze the XM-1, ROLAND, HARRIER, HAWK, MAG-58 machine gun, UK 105mm tank gun, M139 Hispano-Suiza 20mm gun, and SP-70 howitzer systems.
- b. Describe US industry response to the programs.
- c. Show how US statutes and regulations imposed special problems and how they were resolved.
- d. Determine lessons learned and embody a set of principles for future programs.

C. Methodology.

1. Interviews. The personal interview was the primary method of obtaining the information which was the basis for this report. Interviews were conducted with personnel from project offices, commands, arsenals, and staff organizations who had first hand knowledge of the programs under study.

Offices and organizations visited included the ROLAND, XM-1, HAWK, and HARRIER project offices, the USA Armament Materiel Readiness Command (ARRCOM), USA Armament R&D Command (ARRADCOM), USA Tank Automotive R&D Command (TARADCOM), USA Missile R&D Command (MIRADCOM), USA Missile Materiel Readiness Command (MIRCOM); and staff elements, Headquarters, Department of the Army (HQDA), Headquarters, USA Materiel Development and Readiness Command (DARCOM), and Logistics Center, USA Training and Doctrine Command (TRADOC).

2. Program/Contract Documents and Files. During the interviews documents from program files were made available for review by the study team. Included were program management plans, contracts, minutes of international meetings, and a variety of relevant documents. This data proved to be an especially valuable source of lessons learned.

3. Previous Studies and Reports. Other major sources of data were the various articles, studies and reports which had previously been written about the systems under study. These ranged from magazine articles and General Accounting Office (GAO) reports to in-house studies conducted by a number of Army organizations.

4. Other Systems. During the conduct of the research the study team became aware of other standardization and interoperability activities which provided additional lessons. Among these were the Viper-AHAMS missile program and the Aviation Standardization and Interoperability Studies and the procurement of British smoke grenades. Lessons from these programs were integrated into the study.

D. Definition of Terms.

A discussion of NATO cooperation today usually brings to the fore the terms rationalization, standardization and interoperability (RSI). In fact, RSI is the accepted description of the collective defense activities of the NATO nations. The purpose of this paragraph is to define the components of RSI. It appears that, in spite of the recent attention given the subject, the three terms are still misunderstood.

1. Rationalization. Of the three words comprising RSI, rationalization is the most difficult to define. DOD Directive 2010.6, Standardization and Interoperability of Weapon Systems and Equipment Within the North Atlantic Treaty Organization (NATO), 11 Mar 77, states that rationalization is: "Any action that increases the effectiveness of alliance forces through more efficient and effective use of defense resources committed to the alliance."

The DOD definition further says that rationalization applies to both weapons/materiel resources and nonweapons military matters. It includes consolidation, reassignments of national priorities to higher alliance needs, standardization, specialization, mutual support, improved interoperability or greater cooperation. As a Congressional Report (NATO Standardization: Political, Economic, and Military Issues for Congress, Mar 77) stated, rationalization is the "umbrella term used to describe any action which makes more rational use of our Defense resources both as individual nations and collectively." It is a broad term which has as its objective any organizational improvement which provides for more efficiency and effectiveness within NATO. Political and economic issues are within its domain. Note that rationalization encompasses standardization and interoperability, the primary areas of emphasis in this report.

2. Standardization. DODD 2010.6 defines standardization as follows: "The process by which member nations achieve the closest practicable cooperation among forces; the most efficient use of research, development,

and production resources; and agree to adopt on the broadest possible basis the use of: (1) common or compatible operational, administrative, and logistics procedures; (2) common or compatible technical procedures and criteria; (3) common, compatible, or interchangeable supplies, components, weapons or equipment; and (4) common or compatible tactical doctrine with corresponding organizational compatibility."

In the context of this report part (3) of the definition is the most relevant. Hardware commonality is the major theme. The "two-way street" philosophy has resulted in an emphasis on agreements with European countries which provide for a licensing agreement and transfer of technology. This emphasis shows that the US is committed to a policy of greater standardization of equipment with its NATO allies.

3. Interoperability. Interoperability, the third term in the triad, is defined in DODD 2010.6 as: "the ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together." Fuels and ammunition usually come to mind when interoperability is discussed, because the same fuels and ammunition are generally used by all members of the NATO alliance. But interoperability goes further. It may result in common transmissions, engines or other major components for two systems even though the systems themselves may be quite different. Of course, interoperability falls somewhat short of standard NATO equipment. However, achievement of interoperability

may be a more practical and achievable goal.

E. Alternative Means of Accomplishing NATO Standardization and Interoperability.

Discussed below are the various ways of enhancing commonality of equipment in NATO. The current initiative described in paragraph A places greatest emphasis on seeking out NATO candidates for either purchase or cooperative research and development. Licensed production is defined separately even though, in most instances, it will be associated with other alternatives.

1. Cooperative Research and Development (CRD). CRD occurs when the US and one or more NATO countries collaborate in basic military research or the development of military hardware. It normally includes a sharing of technology and costs by the countries and companies involved. Army Regulation 70-41, Cooperation with Allies and Other Nations in Research and Development of Defense Equipment, 3 Jan 74, includes the following types of activities under cooperative research and development.

a. Data exchange. The United States and participating countries exchange technical and scientific information of mutual interest.

b. Allocated development. The US and other participants define an R&D problem in terms of tasks, allocate responsibility for task accomplishment among participants, complete tasks using national resources, and finally share the outcome.

c. Adaptive development. The US obtains for evaluation and possible adoption existing materiel which has been or is being developed

by one or more other participants. It may culminate in a decision to accept the foreign-developed materiel as meeting US requirements.

d. Interdependent development. Under this type the US and one or more other participants agree upon a materiel requirement. One participant is assigned all development responsibility, including funding, and other participants forego development. The outcome or product is evaluated for possible adoption. The final culmination may be a decision to accept foreign-developed materiel as meeting US requirements.

e. Joint development. The US and one or more participants agree upon a materiel requirement. They share responsibility for funding and managerial or operational aspects of development. Finally, the participants evaluate for possible adoption the outcome of the development. The US may accept jointly developed materiel as meeting its requirements.

f. Competitive R&D. Although not covered in AR 70-41, competitive R&D has become another alternative in the list of NATO cooperative R&D options. Competitive R&D envisions independent development of systems by two or more countries. Competition is then conducted between systems. Based on evaluations of test results, one system is selected with licensed production of the winning system offered the losing country. Of course, competitive R&D does not eliminate duplication and redundancy in the R&D effort. If successful, however, it should result in the production of standard systems. A recent attempt at competitive R&D was the competition between the US XM-1 tank and the German LEOPARD tank.

2. Direct Purchase. Direct purchase is another NATO Standardization and Interoperability alternative that is not precisely defined. But it is a rather straightforward option. The US purchases a NATO system to satisfy a US military need. Whether there is competition between US and NATO systems is determined by the status of US systems. The term direct purchase implies either that the foreign system is the only one which will meet the established need or that the foreign system is clearly superior to the US competitor. Licensed production in the US by a US commercial firm or the US Government is anticipated to be a feature of the direct purchase.

3. Coproduction. Coproduction is discussed in DOD Directive 2000.9, International Coproduction Projects and Agreements Between the United States and Other Countries or International Organization, 23 Jan 74. Coproduction encompasses any program wherein the US Government, under the aegis of an international agreement, either directly through the Arms Export Control program or indirectly through specific licensing arrangements by designated commercial firms, enables an eligible foreign government, international organization, or designated commercial producer to acquire substantial "know-how" to manufacture or assemble, repair, maintain, and operate, in whole or in part, a specific weapon, communication or support system, or an individual military item. The directive further states that coproduction may be limited to the assembly of a few end items with a small input of local country parts, or it may extend to

a major manufacturing effort requiring the buildup of capital industries. Army implementation of DOD Directive 2000.9 is found in Army Regulation 795-6, Army International Coproduction Projects, 16 Jan 73. Note that under a coproduction program the US Government or a US commercial firm is the licensor. The US cannot be a licensee under the current definition of coproduction.

4. Licensed Production. Licensed production is the term which usually describes the case in which the NATO country or industrial firm is the licensor and the US Government or firm is the licensee. It is sometimes called "reverse coproduction." Present policy generally provides for the US to obtain licensing rights for any system purchased from a NATO country.

F. Organization and Presentation.

1. Organization. The report is organized into three chapters. Chapter I, Introduction, provides background, statements of the purpose and objectives of the study, and defines terms applicable to the research. Chapter II, Lessons Learned, is the heart of the report and constitutes, for all practical purposes, the Handbook of Lessons Learned. This chapter is discussed in more detail below. Chapter III, Recommendations, suggests ways for insuring the currency and utility of the lessons learned.

2. Presentation. In the past, lessons learned have generally been compiled and presented in the standard report format and have been most often identified by program. In the opinion of the study team, this method of presentation does not result in maximum usefulness of lessons

learned. There are two reasons for this opinion. One is that the reader often feels that the lessons learned from one program do not apply to his program because his program is different. Secondly, it is difficult to trace the lessons to a particular functional area of interest, such as configuration management, engineering, or contracts.

An alternate way of presenting lessons learned is used in this report. Lessons learned have been categorized into major areas, primarily with a functional orientation. A general lesson learned is described which is designed to attract the reader's attention. Included under the lesson learned are related statements which clarify or reinforce the major point. In some instances, other lessons learned of less magnitude will appear. Lessons learned are not identified to any particular weapon system with one exception. The coproduction lessons learned were totally derived from an analysis of the Basic HAWK and Improved HAWK programs. Hence, no attempt has been made to disguise this program. The HAWK was the only system studied which did not involve a US purchase of foreign hardware or technology. The HAWK coproduction lessons are included in one section of Chapter II, regardless of functional area.

CHAPTER II

LESSONS LEARNED

A. Orientation. This chapter presents the results of study team analysis of specific RSI projects involving the US military services and one or more of the European NATO nations. The study results are formulated as lessons learned and encapsulate both objective information and subjective judgments.

B. Categorization of Lessons Learned. The lessons learned have been classified into 13 major subject categories so that readers with a particular interest only in certain areas can readily locate the lessons of interest to them. The ordering of the subject categories attempts to follow the life cycle of a project, starting with overall RSI policy, then progressing through program initiation, project management, the legal agreements, the technological and engineering considerations and the logistic support. All but the last category concern projects where the United States has purchased foreign technology and/or hardware. The last category, Coproduction, covers the lessons learned in transferring US technology to European members of NATO. The 13 categories are as follows:

- Public Policy Related to RSI

- Program Initiation

- Program Management

- Memoranda of Understanding (MOUs)

- Licensing

- Contracts

- Technical Considerations

Technology Transfer

Configuration Management

Quality Assurance

Test and Evaluation

Logistics

Coproduction

C. Format of Presentation of Lessons Learned. Within each of the major subject categories, a number of lessons learned have been developed. These have been ordered within each category according to importance and degree of generalization or specialization. The catalog of lessons learned by category is presented in paragraph D below. Detailed narrative expanding on each lesson learned follows the last catalog entry. The catalog references the page where the detailed narrative of the particular lesson learned may be found. The abbreviation "LL" has been selected for "Lessons Learned" and is used in identifying the narrative descriptions.

D. Catalog of Lessons Learned and Detailed Narratives.

Category	Lessons Learned	See Page
Public Policy Related to RSI	1 - The President and the Congress Have Strongly Indorsed NATO RSI	17
	2 - Current Legislation Still Must Be Interpreted as Impeding NATO RSI	19
	3 - Proposed Legislation Will Enhance NATO RSI	21
	4 - Congressional Resistance to US Purchases of Foreign Systems Can Be Expected on a Case-By-Case Basis	23

Category	Lessons Learned	See Page
Program Initiation	1 - Consideration of NATO Systems to Meet US Needs Must Begin Early	24
	2 - An RSI Plan Is Required on Cooperative R&D Programs	26
	3 - The RSI Plan Should Be a Comprehensive Assessment of the Potential for Cooperation	27
	4 - Cost Estimation on Cooperative R&D Programs Does Not Fit the Normal US Pattern	30
Program Management	1 - The US Organization for an RSI Program Depends on Program Type and Size	32
	2 - A Strong and Effective Program Management Office Is Needed for a Cooperative R&D Program	33
	3 - Personnel Skills within a Project Office Should Be Tailored to Meet the Need.	36
	4 - Project Managers Should Become Familiar with the DOD and Army Staff Elements Which Deal Directly with RSI Management	38
	5 - An Understanding of the NATO Organizations with Primary Responsibilities for RSI Should Prove Useful to Program Management Personnel	42
Memoranda of Understanding	1 - A Memorandum of Understanding (MOU) Is Usually Negotiated for Every RSI Program	44
	2 - The Format for an MOU Covering a Cooperative Research and Development Program Is Well-Established	47
	3 - The Content of a Direct Purchase MOU Depends on the Foreign Government Role	60
Licensing	1 - The Project Manager Should Insure that Licensing Agreements Are Consistent with RSI Objectives of the Program	66
	2 - Certain Terms and Conditions Are Common to All Licensing Agreements	73
	3 - Certain NATO Publications May Be Useful in Drafting Licensing Agreements	83
	4 - A Well-Negotiated Licensing Agreement Is a Key Feature of an RSI Program	85
	5 - Licensing Agreements Must Be Approved by Higher Authority	90
Contracts	1 - Procurement Planning Is Essential to Program Success	93
	2 - A Government to Government Contract Is Accomplished by a Letter of Offer and Acceptance (LOA)	99
	3 - Contract and RFP Procedures for an RSI Program Differ from Those of a Normal US Program	100

Category	Lessons Learned	See Page
Contracts (Cont'd)	4 - The Uniform Contract Format Provides an Excellent Structure for the RFP and the Contract	110
	5 - US Contract Provisions May Either Be Inappropriate or Require Tailoring on Foreign Contracts	115
Technical Considerations	1 - European Design and Production Philosophies Differ from Those of the US	122
	2 - Engineering Practices in Europe Vary Widely From Those in the US	123
	3 - NATO Standardization Agreements (STANAGS), Allied Publications (APs) and Data Exchange Agreements (DEAs) Support NATO Standardization and Interoperability	126
Technology Transfer	1 - Successful Technology Transfer Requires a Formal Process for Data Conversion	128
	2 - Parts Selection for the US-Produced System Is a Key Factor in Technology Transfer	130
Configuration Management	1 - Configuration Management Is a Prerequisite for Achievement of NATO Standardization and Interoperability	132
	2 - Configuration Control Is Required on Cooperative R&D Programs at Both International and National Levels	134
	3 - A Tailored CM Plan Is Required for a Direct Purchase Program on Which US Production Is Anticipated	138
Quality Assurance	1 - Procedures for Procurement Quality Assurance are Covered by NATO Agreements	141
	2 - Quality Assurance Plans for Foreign Purchases Must be Developed and Implemented	143
Test and Evaluation	1 - Competitive Testing Has Been Upheld by the Comptroller General as a Legitimate Method of Selecting a System	145
	2 - Fair and Objective Testing Is Essential When Systems of Several Countries Are Competing	146

Category	Lessons Learned	See Page
Test and Evaluation (Cont'd)	3 - Duplicate and Redundant Testing Must Be Avoided 4 - A Joint Test Program Is Recommended for Cooperative R&D with Technology Transfer	147 148
Logistics	1 - There Must Be Common Understanding of Terms 2 - The Achievement of RSI May Increase US Logistics Support Requirements 3 - Weapon System Standardization Leading to a Joint Logistic Support System Is Unlikely 4 - Logistic Interchangeability of Components May Be Difficult to Achieve 5 - International Interchangeability (I ²) of Components Would Make Feasible a Cooperative Logistic Support System (CLSS) 6 - Deterrents Exist to US Army Participation in a Cooperative Logistic Support System 7 - The NATO Maintenance and Supply Agency (NAMSA) Is the Most Likely Route for Implementing a Cooperative Logistic Support System 8 - The Weapon System Development Process Differs between the US and the Other NATO Nations 9 - Logistic Support Concepts Differ between the US and the Other NATO Nations 10- Availability/Applicability of Logistic Support Information of Foreign Systems Is Questionable 11- Integrated Logistic Support (ILS) Planning for a Foreign System May be More Difficult than for a US-Developed System 12- US Purchase of an "Off-the-Shelf" Foreign System Raises Special Logistic Support Considerations 13- NATO Stock Numbers Will Facilitate Supply Support	151 154 155 156 157 159 161 163 164 165 167 169 172
Coproduction	1 - Prerequisites for Successful Coproduction Are System Maturity, Strong Program Management and Multinational Empathy 2 - The Consortium Method of Management Has Inefficiencies 3 - Extended Negotiations Must Be Expected in Reaching Coproduction Agreements 4 - Coproduction Requires Workload Apportionment and Careful Scheduling to European Industrial Plants 5 - Configuration Management and Technology Transfer Responsibilities Must Be Defined for Each Participant 6 - A Configuration Management Plan Is Essential to Maintain the Integrity of the Technical Data Package	173 174 177 181 183 184

PUBLIC POLICY RELATED TO RSI
LL 1

THE PRESIDENT AND THE CONGRESS HAVE STRONGLY INDORSED NATO RSI

- o The President in his NATO Ministerial Meeting speech of May 1977 said the following:

"We must make a major effort to eliminate waste and duplication between national programs to provide each of our countries an opportunity to develop, produce and sell competitive defense equipment; and to maintain technological excellence in all allied combat forces. To reach these goals our countries will need to do three things:

First, the United States must be willing to promote a genuinely two-way trans-Atlantic trade in defense equipment. I have instructed the Secretary of Defense to seek increased opportunities to buy European defense equipment where this would mean more efficient use of allied resources. I will work with the Congress of the United States to this end. . ."

- o At the same May 1977 NATO meeting, the President took the initiative in revitalizing the NATO planning process. US proposals focused on the need to adopt and implement the NATO Long Term Defense Program (LTDP) in ten critical areas: readiness, reinforcements; reserve mobilization; maritime posture; air defense; communications, command, and control; electronic warfare; logistics; rationalization and theater nuclear forces. The LTDP was unanimously accepted by the participating Heads of State and Government at the NATO summit meeting of May 1978.

- o The Culver Nunn Amendment (PL 94-106, 7 October 1975, amended by PL 94-361, dated 14 July 1976) states:

PUBLIC POLICY RELATED TO RSI
LL 1 (Continued)

"It is the policy of the United States that equipment procured for the use of personnel of the Armed Forces of the United States stationed in Europe under the terms of the North Atlantic Treaty should be standardized or at least interoperable with equipment of other members of the North Atlantic Treaty Organization. In carrying out such policy the Secretary of Defense shall, to the maximum feasible extent, initiate and carry out procurement procedures that provide for the acquisition of equipment which is standardized or interoperable with equipment of other members of the North Atlantic Treaty Organization whenever such equipment is to be used by personnel of the Armed Forces of the United States stationed in Europe under the terms of the North Atlantic Treaty Whenever the Secretary of Defense determines that it is necessary, in order to carry out the policy expressed in paragraph (1) of this subsection, to procure equipment manufactured outside the United States, he is authorized to determine, for the purposes of section 2 of title III of the Act of March 3, 1973 (47 Stat. 1520; 41 U.S.C. 10a), that the acquisition of such equipment manufactured in the United States is inconsistent with the public interest." (41 U.S.C. 10a is the Buy American Act.)

- o In the Appropriations Act of 1978 an exception was made to the preference for domestic specialty metals on defense contracts. Now incorporated into Section 6-303xi of the Defense Acquisition Regulation (DAR), formerly called the Armed Services Procurement Regulation (ASPR), an exception to buy specialty metals is allowed when:

"Such purchases are necessary to comply with agreements with foreign governments requiring the United States to purchase supplies from foreign sources for the purposes of offsetting sales made by the USG or US firms under approved programs serving defense requirements, or where such procurement is necessary in furtherance of the standardization and interoperability of equipment requirements with NATO."

PUBLIC POLICY RELATED TO RSI
LL 2

CURRENT LEGISLATION STILL MUST BE INTERPRETED AS IMPEDING NATO RSI

o Although waivers to the legislation discussed below may be granted in support of RSI, the statutes still exist and must be considered a hindrance to international cooperation.

- The Buy American Act (41 U.S.C. 10a and b) gives preference to domestic end products in government procurement. The following excerpts from the Appropriations Act of 1975 reiterate the Congressional stance on the Buy American Act.

"Sec. 707.(a) No funds authorized to be appropriated by this or any other Act may be obligated under a contract entered into by the Department of Defense after the date of the enactment of this Act for procurement of goods which are other than American goods unless, under regulations of the Secretary of Defense and subject to the determinations and exceptions contained in title III of the Act of March 3, 1933, as amended (47 Stat. 1520; 41 U.S.C. 10a, 10b), popularly known as the Buy American Act, there is adequate consideration given to -

(1) the bids or proposals of firms located in labor surplus areas in the United States as designated by the Department of Labor which have offered to furnish American goods;

(2) the bids or proposals of small business firms in the United States which have offered to furnish American goods;

(3) the bids or proposals of all other firms in the United States which have offered to furnish American goods;

(4) the United States balance of payments;

(5) the cost of shipping goods which are other than American goods; and

(6) any duty, tariff, or surcharge which may enter into the cost of using goods which are other than American goods.

PUBLIC POLICY RELATED TO RSI
LL 2 (Continued)

- The Bayh Amendment to the Appropriations Act of 1973, PL 92-570, places Buy American Provisions on R&D Procurement. Excerpts from the amendment read as follows:

"No funds appropriated for the Department of Defense are available for entering into any contract or agreement with any foreign corporation, organization, person, or other entity for the performance of research and development in connection with any weapon system or other military equipment for the Department of Defense when there is a United States corporation, organization, person or other entity equally competent to carry out such research and development and willing to do so at a lower cost."

PUBLIC POLICY RELATED TO RSI
LL 3

PROPOSED LEGISLATION WILL ENHANCE NATO RSI

- o H.R. 12837 was introduced in the House of Representatives on May 23, 1978. The bill would give the Secretary of Defense broad authority to waive the application of laws in order to support NATO RSI. Specific excerpts from the bill state:

"(b) The Secretary of Defense, or his delegate, may for any purchase of or contract (including any subcontract thereunder), or classes of purchases or contracts, for property or services to be made from a foreign government (or agency thereof) or international organization (or subsidiary bodies thereof) waive the application of any provisions of law specifically prescribing procedures to be followed in the formation of contracts, terms and conditions to be included in contracts, requirements or preferences to be given to goods grown, produced or manufactured in the United States or in United States Government-owned facilities or for services to be performed in the United States, or regulating the performance of contracts, if he has determined that--

"(1) The purchase or contract to which the waiver relates will be in the furtherance of one or more of the policies stated in subsection (a) (1) of this section."

"(2) Consonant with subsection (a) (2) of this section, such waiver is desirable under principles of comity and reciprocity applicable to purchases and contracts among governments and international organizations."

"(3) The waiver will facilitate the accomplishment of the policies stated in subsection (a) (1) of this section and is otherwise in the public interest."

PUBLIC POLICY RELATED TO RSI
LL 3 (Continued)

- o H. R. 11607 was introduced in the House of Representatives on March 16, 1978. The bill was introduced to give the Secretary of Defense the authority to implement NATO Standardization Agreement (STANAG) 2135, Procedures for Requesting and Providing Logistics Assistance, 15 November 1972 (see Logistics LL 6 and LL 7). Currently, the DOD cannot implement because the purchase of logistics support from NATO and the sale to NATO on an exchange or reimbursable basis would violate US laws. The bill reads, in part, as follows:

"(d) (1) In order to carry out the policy expressed in subsection (a) of this section, the Secretary of Defense is authorized, notwithstanding any other provision of law and with the foreign policy guidance of the Secretary of State to enter into and carry out standardization agreements on a bilateral or multilateral basis with appropriate authorities of North Atlantic Treaty Organization countries and North Atlantic Treaty Organization subsidiary bodies for operational cooperation and cross-servicing among the land, air, and naval forces of the North Atlantic Treaty countries deployed in Europe and its adjacent waters and North Atlantic Treaty Organization subsidiary bodies through the interchange of equipment, materials, goods, and other supplies (excluding aircraft, missiles, naval vessels, tracked combat vehicles, other weapons, or naval torpedoes) and services (including use of facilities)."

- o Neither H. R. 12837 nor H. R. 11607 were enacted into law by the 95th Congress. The original text of H. R. 11607, in part quoted above, was redrafted by DOD at the request of The Congress, which objected to its broad language. Despite these objections to the original H. R. 11607, the necessity for the proposed legislation was recognized by the Congress. DOD will seek to have similar proposed legislation introduced when the 96th Congress convenes.

PUBLIC POLICY RELATED TO RSI
LL 4

CONGRESSIONAL RESISTANCE TO US PURCHASES OF FOREIGN SYSTEMS
CAN BE EXPECTED ON A CASE-BY-CASE BASIS

- o The Congress has taken collective action in support of NATO standardization and interoperability. However, they still may resist individual purchases for a variety of reasons. The primary reasons usually relate to protection of US industry and to whether the purchase is in the best interests of the US militarily. The two examples below illustrate the problem.

-A Congressional bloc attempted to overturn the Army decision to buy the MAG-58 machine gun from Belgium.

-In the spring of 1978 the House Armed Services Investigations Subcommittee was very critical of the decision to use the German 120mm gun in lieu of the US 105mm gun on the XM-1 tank.

PROGRAM INITIATION
LL 1

CONSIDERATION OF NATO SYSTEMS TO MEET US NEEDS MUST BEGIN EARLY

- o Department of Defense (DOD) policy as stated in DODD 2010.6 is that the Army, Navy and Air Force must include NATO standardization and interoperability goals in their development and procurement programs for both major and minor equipment items. The Decision Coordinating Paper (DCP) must address NATO standardization. The analysis will include the contribution of the US program to NATO standardization and interoperability, information on the availability of NATO systems, and the potential for cooperation. Cost and Operational Effectiveness Analysis (COEA's) and Life Cycle cost studies must include the costs of NATO candidate systems. Further, the COEA must include an analysis of NATO System Operational Capabilities.
- o It is advisable to become familiar with NATO documents describing threat perceptions; for example, Military Committee (MC) 161-78. Threat documents are revised annually and may be obtained through the appropriate Army NATO sub-registry.
- o The Army should establish close and parallel relationships with the NATO Organization and the NATO countries for the definition of proposed new requirements. Army development commands should contact parallel development activities of the NATO countries to discuss reciprocal and mutually beneficial exchanges of technology, cooperative R&D programs and possible licensing arrangements.

PROGRAM INITIATION
LL 1 (Continued)

- o The Army will examine NATO systems, system derivatives, subsystems, and components early in the development cycle, weighing the advantage of standardization with regard to alliance combat effectiveness as well as the impact on US forces. Identification of NATO candidate systems requires investigating a variety of sources, to include:
 - US Standardization Representatives
 - Military Assistance Groups
 - Foreign Science and Technology Center (FSTC)
 - Foreign periodicals
 - International Defense Review
 - Private industry
 - NATO Working Groups
- o Coordination of RSI issues with foreign governments in the conceptual phase cannot be overemphasized. If discussions take place after each country is well into development, costs of redesigning and reprogramming can seriously impair chances for cooperation. Also, a compromise system could conceivably fall short of meeting the technical needs of any of the participants.

PROGRAM INITIATION
LL 2

AN RSI PLAN IS REQUIRED ON COOPERATIVE R&D PROGRAMS

- o DODD 2010.6 and AR 1000-1, Basic Policies for Systems Acquisition, 1 Apr 78, state that NATO standardization and interoperability must be considered throughout the materiel system development process. Standardization and interoperability must be addressed at formal decision reviews, especially at Army Systems Acquisition Review Council (ASARC) and Defense Systems Acquisition Review Council (DSARC) reviews.
- o The RSI plan for a system must be submitted for Office of the Secretary of Defense (OSD) approval within 60 days after Mission Element Need Statement (MENS) approval.
- o The RSI Plan must be flexible and dynamic. Proposals, approvals, and negotiations with NATO countries may necessitate changes. Each plan must be tailored to meet the specific circumstances of the program. The plan should be an objective and realistic assessment of the potential for cooperation. Parochialism, or support of biases, may lead higher authority to believe that RSI is receiving only lip service.
- o Sharing of advanced technology is a prerequisite to total success in NATO standardization and interoperability. Achievement of RSI agreement will undoubtedly require a willingness on the part of the US to accept compromises on schedules and costs. There must also be a willingness to accept the NATO countries as full technological and economic partners.

PROGRAM INITIATION
LL 3

THE RSI PLAN SHOULD BE A COMPREHENSIVE
ASSESSMENT OF THE POTENTIAL FOR COOPERATION

- o The objective of the RSI plan should be defined as precisely as possible. For example, the objective may be an assessment of NATO standardization possibilities in the development of anti-armor systems.
- o The plan should assess the perceived threat to be met by systems of the next generation. Included should be both US and NATO perceptions of the threat. As an example, the anti-armor system may be expected to defeat improvements in armor, sophisticated electronic countermeasures and battle-field obscurants.
- o A comparison of US and NATO doctrine pertaining to the systems under study should be included. In helicopters, it may be related to concepts of tactical employment envisioned for the aircraft; e.g., the attack, scout and utility roles.
- o Desired operational characteristics for US and NATO systems should be contrasted. Include the timeframes for which the desired characteristics have been postulated. If there are noticeable differences in the characteristics between the US and other NATO countries, predict whether or not the differences may be reconciled.

PROGRAM INITIATION
LL 3 (Continued)

- o An analysis of current and future systems is extremely useful. Identify current systems deployed by US and NATO countries. Discuss in some detail the characteristics of the systems such as age and capabilities. A discussion of current equipment deficiencies is necessary. Deficiencies of US equipment appear in the MENS. Address deficiencies in the fielded systems of the NATO countries. These may include such shortcomings as lack of crew protection, slow rate of engagement or susceptibility to counter-measures. Describe the status of systems under development in NATO and US. Include fielding dates for the various systems and plans for cooperation among the NATO nations. An investigation of subsystems may be required. Address such factors as integration problems, critical technologies, and system growth potential,
- o Address a prospective strategy for standardization among the NATO countries. Suggest ways to improve standardization and propose means of accomplishment. Prepare a set of detailed alternative acquisition strategies.
- o If the analysis shows that the potential for a cooperative R&D program exists, a plan for achieving cooperation should be described. Suggest possible teaming arrangements among participating countries, including number of countries to be involved. Delineate management alternatives; such as joint development, single country responsibility for development with coproduction opportunities for other participants, or independent development with a winner being determined through testing. Include the extent of

PROGRAM INITIATION
LL 3 (Continued)

cooperation envisioned; that is, a recommendation related to the best teaming arrangement and management strategy. Isolate issues which must be resolved, for example, data rights, technology transfer and data exchange. Schedule actions to be accomplished.

- o If the analysis does not support a cooperative program, justification will be required. In this case, indicate what actions might facilitate future attempts at standardization.

PROGRAM INITIATION

LL 4

COST ESTIMATION ON COOPERATIVE R&D PROGRAMS DOES NOT FIT THE NORMAL US PATTERN

- o Cost estimation is inherently more difficult on a cooperative program.
 - Unusual requirements are dictated by international considerations. These include licensing and data rights; European parts, materials and processes; technical data package conversion; and international versus US standardization. Costs associated with unique international features must be accounted for when estimating the cost of a development program and the ensuing production and deployment.
- o Normal parametric Cost Estimating Relationships (CER's) cannot be used with accuracy on an international development program. A CER is usually developed from data accumulated during R&D of a number of similar systems. The dissimilarity between the normal US R&D methodology and cooperative R&D corrupts the process. The use of CERs from similar US programs generally tends to project unrealistic cost estimates. Parametric estimates and CER's derived from subsystems and components at a lower level within the Work Breakdown Structure (WBS) may give a more realistic projection of costs. But even these have to be tempered to reflect the special costs of an international program.
- o Extensive cost risk analysis must be performed at the time of the initial cost estimate. In this risk analysis, identify the many areas of uncertainty associated with the program. On the ROLAND, for example, the analyst was

PROGRAM INITIATION
LL 4 (Continued)

required to know a number of things in order to do a comprehensive analysis. He had to fathom the maturity of the European system, the status of the Technical Data Package (TDP), unique manufacturing processes required, and unique material and parts requirements.

- o Thorough analysis should be performed of the maintenance and support concept and requirements of the foreign system. If possible, an operating and support (O&S) cost model that incorporates system peculiar characteristics such as failure rates and mean-time-to-repair should be used for O&S cost estimating.

PROGRAM MANAGEMENT
LL 1

THE US ORGANIZATION FOR AN RSI PROGRAM
DEPENDS ON PROGRAM TYPE AND SIZE

- o In all likelihood, the management structure for a particular cooperative R&D program will be determined in accordance with AR 70-17, System/Program/Project/Product Management, 11 Nov 76.. A Project Manager will normally be chartered for cooperative R&D programs.
- o The management structure for a direct purchase program may also be the formal type if the criteria prescribed in AR 70-17 are met. Otherwise, a less formal management organization in accordance with the criteria of DARCOM Reg 614-13, Developmental/Readiness Project Officers, 12 Aug 76, may be appropriate. If the program is not to be intensively managed, the acquisition will fall within the functional management system of the materiel readiness command. In any case, a manager should be designated as the focal point for program management.
- o A manager of a foreign program who does not have a clearly defined staff must have the authority to call upon functional organizations to provide assistance as needed. Expertise will be required in legal matters, engineering, contracting, logistics support, and a variety of other fields

PROGRAM MANAGEMENT
LL 2

A STRONG AND EFFECTIVE PROGRAM MANAGEMENT OFFICE
IS NEEDED FOR A COOPERATIVE R&D PROGRAM

- o A clearly designated Project Manager (PM) should head the project. He must be of sufficient grade to obtain recognition and response from all national and international organizations and agencies with which he has contact. This is of special importance in dealing with foreign governments and industries.
- o The Project Manager must be diplomatic but firm in exercising his authority. He must familiarize himself with the mores and social customs of the NATO countries. National holidays, for example, are more prevalent in Europe and can exert a strong influence on European work schedules.
- o The basic organization of the office will be similar to that of the PM office for a US system. But the office must be adapted to meet the special requirements of the program. Additional organization elements will be needed to perform the added functions of an international program. A typical organization chart for a RSI Project Office is shown in Figure 1 .
- An Office of International Programs is needed to prepare or assist in the preparation and coordination of memoranda of understanding (MOUs) and licensing considerations. The office is the focal point for international matters, particularly at the working level.

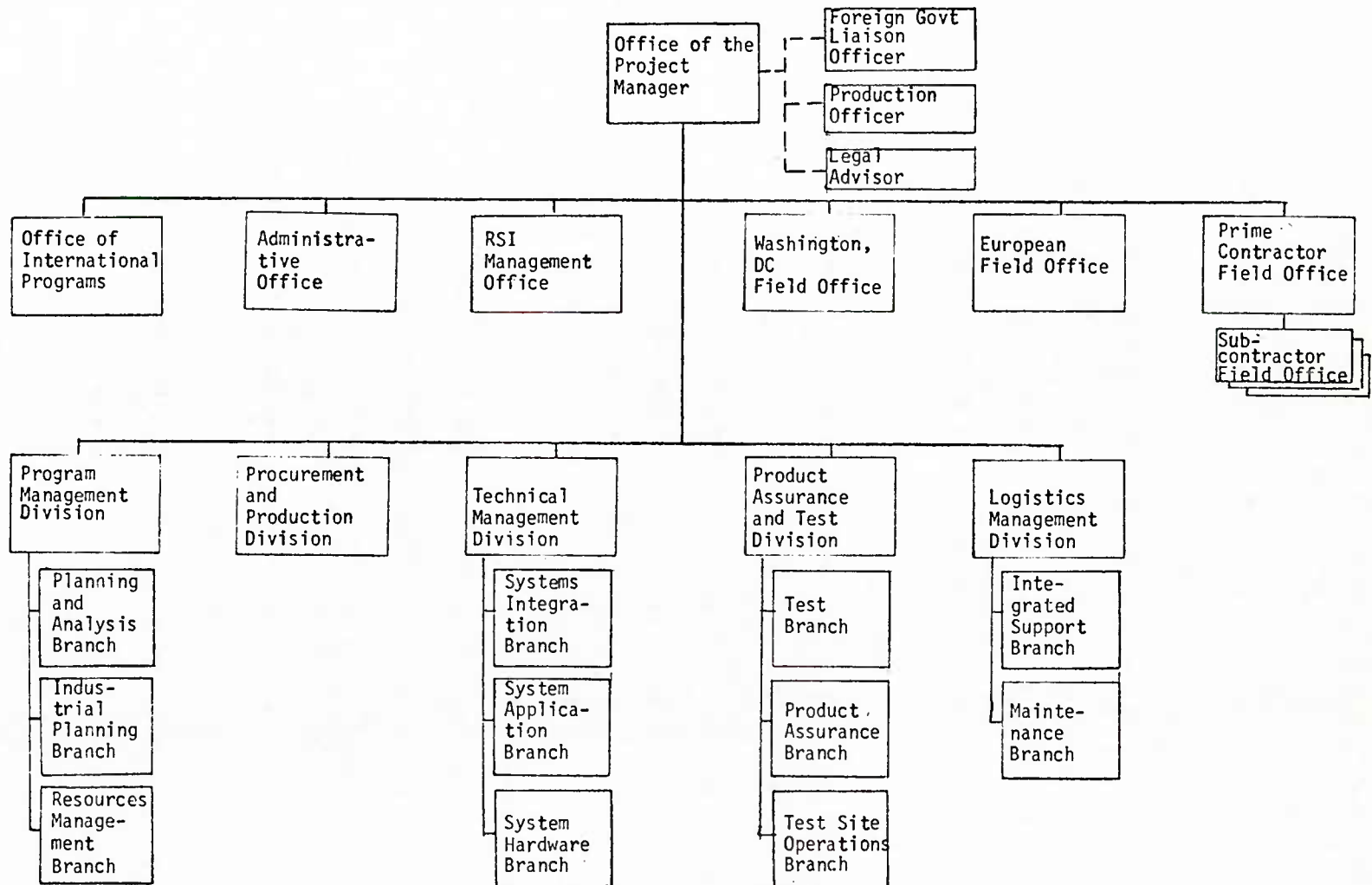


FIGURE 1. ORGANIZATION CHART FOR AN RSI PROJECT OFFICE.

PROGRAM MANAGEMENT
LL 2 (Continued)

- A Technical Management Division may be needed to be responsible for maintaining a common US and European design.

- A Rationalization, Standardization and Interoperability Management Office will be needed to perform configuration management functions and manage the technology transfer effort.

- The Product Assurance and Test Division is of special significance, especially in the administration of joint test programs.

- A European Field Office is recommended to facilitate data exchange and to serve as a communication channel.

- A Legal Advisor is invaluable in providing advice related to the various legal agreements and proprietary considerations.

- The Program Management Division, while not unique to an RSI program, should be organized early so that project planning, programing and budgeting can begin. The Division should also develop a responsive management information system.

PROGRAM MANAGEMENT
LL 3

PERSONNEL SKILLS WITHIN A PROJECT OFFICE SHOULD BE TAILORED
TO MEET THE NEED

- o An expanded staff must be expected for any project office handling an international program. A 50 to 60 percent increase in manning over the normal level is not unusual. Attempts should be made to recruit personnel who have worked on other international projects as their experience will be invaluable in expediting the project.
- o The project office should be staffed with or have access to linguists, translators and/or interpreters, as required.
 - A full-time linguist, if available, can be a special asset because of his knowledge of language nuances. This is particularly valuable in high level discussions related to formal agreements between the countries.
 - Translators will be needed for conversion of all documents written in a foreign language. The number of translators required will depend upon the volume of material received. A "rule of thumb" is that a translator can handle 5 to 10 pages of text per day.
 - Interpreters are required for the many conferences and meetings conducted on international programs. It is unlikely that the project office can justify permanent staff interpreters for this function. Hence, it must depend on outside assistance. Although US interpreters capable of

PROGRAM MANAGEMENT
LL 3 (Continued)

simultaneous or consecutive translation are in short supply, a limited number are available through the State Department. It becomes imperative for the project office to plan its meetings well in advance and submit its request for interpreters to the State Department as early as possible.

- Should a PM elect to have a member of his staff qualified as an interpreter, he must submit a request to the State Department which conducts the training. The applicant must pass a prescreening by the State Department. The training takes several months at an estimated cost of \$1,000 to \$1,500 per week.

- o Project personnel must have NATO security clearances to handle classified NATO material. The clearances are obtained in accordance with the procedures of AR 380-15, Safeguarding Classified NATO information, 2 Dec 74. The Regulation requires that NATO classified material be stored separately from US classified information.

PROGRAM MANAGEMENT
LL4

PROJECT MANAGERS SHOULD BECOME FAMILIAR WITH
THE DOD AND ARMY STAFF ELEMENTS WHICH DEAL
DIRECTLY WITH RSI MANAGEMENT

- o A number of DOD and DA offices have primary responsibilities pertaining to NATO RSI. The missions of several major organizational elements are described under this lesson. It is not intended that the list be inclusive of all the DOD and DA offices with an RSI interest. Rather, highlighted are major offices with which project personnel might be involved.
- o Department of Defense
 - The Advisor for NATO Affairs to the Secretary and Deputy Secretary of Defense is responsible for coordination of the NATO Long Term Defense Program and the Short Term Initiatives.
 - The Assistant Secretary of Defense for International Security Affairs (ASD (ISA)) is responsible for overall NATO RSI policy.
 - The Under Secretary for Research and Engineering is responsible for research, development and acquisition policy pertaining to RSI.
- o Department of the Army
 - The Deputy Chief of Staff for Operations and Plans (DCSOPS) responds directly to the Under Secretary of the Army and the Vice Chief of Staff who represent the Secretary and Chief of Staff on RSI issues. He is responsible for Army implementation of RSI policy and overall coordination and monitorship.

PROGRAM MANAGEMENT
LL4 (Con't)

- The Department of the Army International Rationalization Office (DAIRO) is the focal point at the DA level for RSI matters and provides a single authoritative interface in Headquarters, Department of the Army regarding NATO and international standardization activities.

-The Deputy Chief of Staff for Research, Development and Acquisition (DCSRDA), in coordination with the Office of the Assistant Secretary of the Army for RDA, develops and supervises RDA aspects of Army NATO RSI programs.

- The Assistant DCSRDA for International Programs is the point of responsibility for RSI matters.

- The International Office (IO) under Assistant DCSRDA is the point of contact on NATO R&D and exchange programs.

- The Primary Standardization Office (PSO) is the point of contact for the American, British, Canadian, Australian (ABCA) Armies Standardization Program.

- The Department of the Army System Coordinator (DASC) is the individual designated by the DCSRDA to function as the HQDA point of contact for all aspects of a system development and acquisition. The role of the DASC is vital. He is the extension in Washington and at the Pentagon of the Project Office, and he acts as the eyes and ears of the project. His intelligence concerning the mood of Congress, current funding projections, and lobbying activities is invaluable to the project manager.

PROGRAM MANAGEMENT
LL4 (Con't)

-The Deputy Chief of Staff for Logistics (DCSLOG) is responsible for logistics matters related to RSI.

- The Special Assistant for NATO Logistics in Directorate of Plans, Readiness and Systems is the point of contact.

- In Figure 2 are shown the principal DOD/DA elements with responsibilities in regard to NATO RSI.

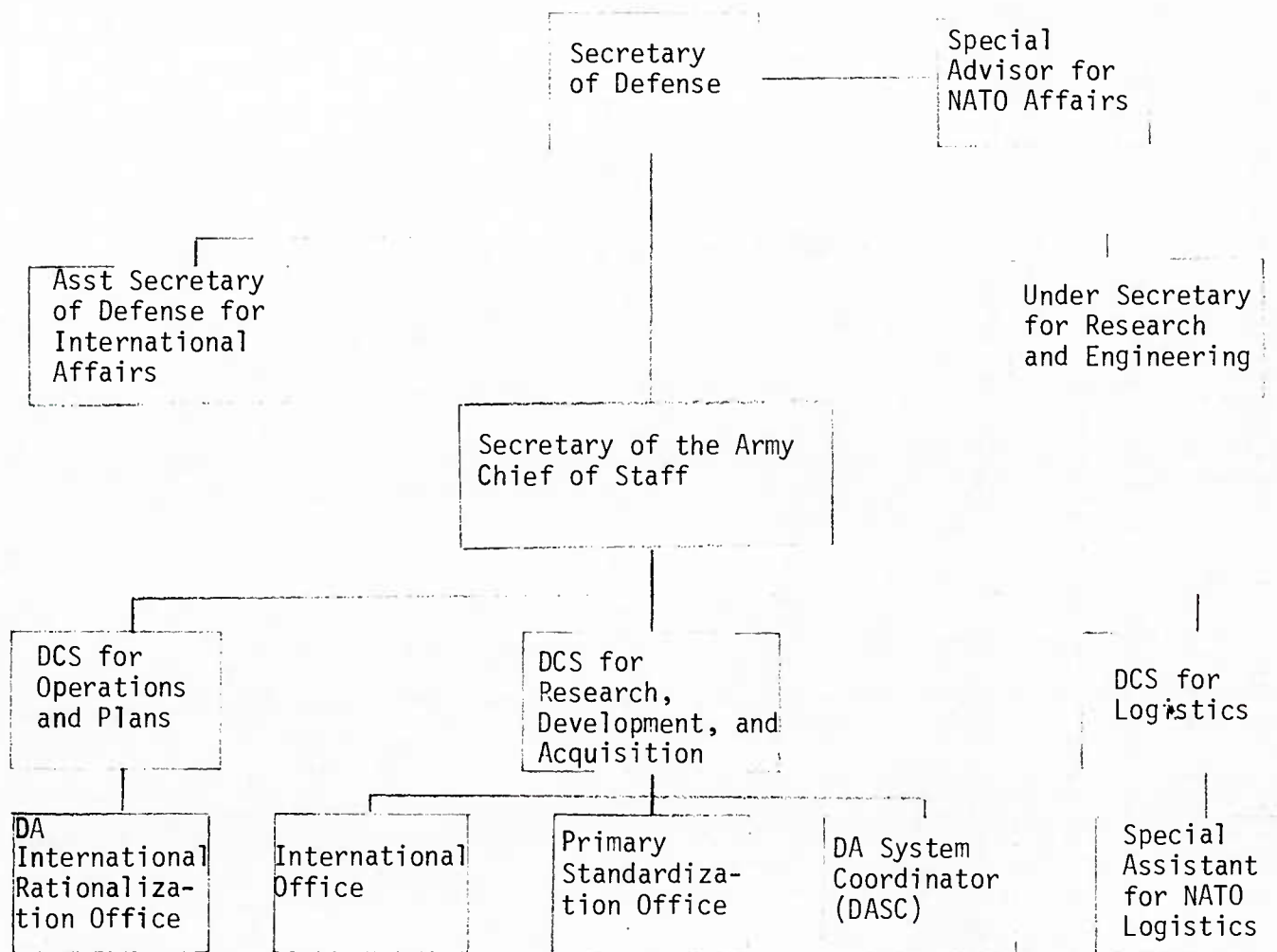


FIGURE 2. PRINCIPAL DOD/DA ELEMENTS DEALING WITH NATO RSI.

PROGRAM MANAGEMENT
LL 5

AN UNDERSTANDING OF THE NATO ORGANIZATIONS WITH PRIMARY RESPONSIBILITIES
FOR RSI SHOULD PROVE USEFUL TO PROGRAM MANAGEMENT PERSONNEL

- o The principal NATO agencies with RSI responsibilities are the Conference of National Armament Directors (CNAD) and the Military Agency for Standardization (MAS), a subordinate element of the Military Committee. The organizational relationships are shown in figure 3.
- o The CNAD primarily directs its efforts toward the promotion of cooperation in research, development and production of military equipment within NATO. Specific tasks are accomplished by 32 panels and working groups of the conference.
- o The MAS is concerned with the interoperability of existing equipment and with procedural and doctrinal standardization.

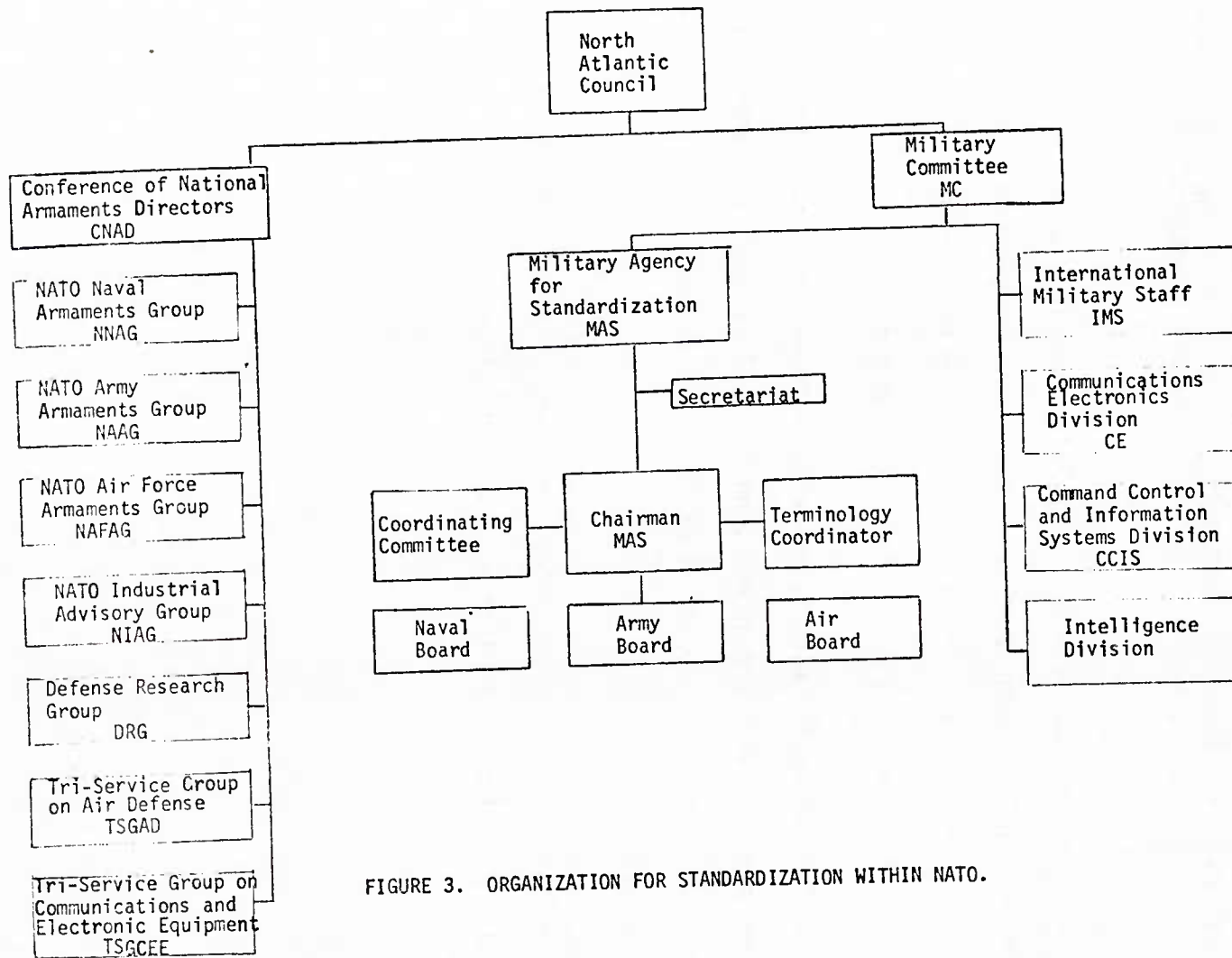


FIGURE 3. ORGANIZATION FOR STANDARDIZATION WITHIN NATO.

MEMORANDA OF UNDERSTANDING
LL 1

A MEMORANDUM OF UNDERSTANDING (MOU) IS USUALLY NEGOTIATED FOR EVERY RSI PROGRAM

- o An MOU is an international agreement between governments or between a government and an international organization. It is the primary means of promoting RSI through cooperative research and development and production programs. Although international agreements are in existence with most NATO countries, a specific MOU is usually required to cover each unique RSI program. The International R&D Office, HQ DARCOM, is normally responsible for negotiating the MOU for Army activities. However, higher authority may direct the Project Manager or some other person of authority to prepare and negotiate the agreement.
- o The content of an MOU may vary widely from program to program. Some MOUs are umbrella type agreements which give only general guidelines regarding program objectives. Other MOUs are detailed, giving specific criteria to be followed during program implementation. Areas that should be covered in an MOU include objectives of the program, responsibilities and obligations of the parties, and legal doctrine governing agreements resulting from the program.
- o Negotiations on the MOU should begin as soon as possible. A 12 to 18 month period to negotiate an MOU is not unusual. For MOUs originating within DARCOM the review cycle from initiation to final negotiation is presented in Figure 4.

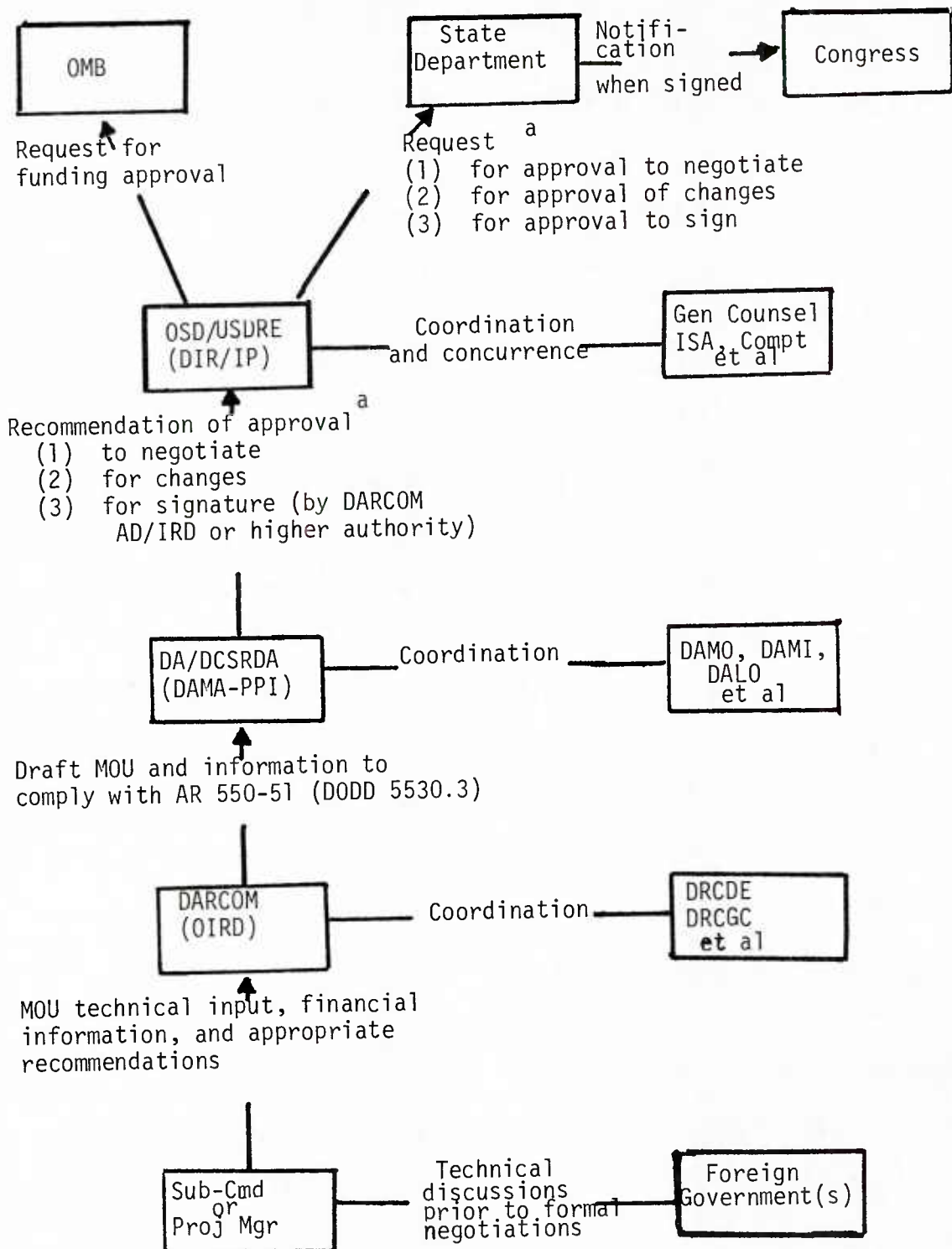


FIGURE 4. MOU EVOLUTION PROCESS*

^a Requires essentially three complete cycles to complete (1), (2), and (3).

General Research Corp, DARCOM OIRD's Role in NATO Rationalization/Standardization/Interoperability, Feb 78, p. 95

MEMORANDA OF UNDERSTANDING
LL 1 (Continued)

- o Agreement should be reached prior to receipt of firm offers from foreign firms. The MOU can then provide a basis for equal evaluation of all firms. Subsequent assignment of members of the MOU negotiating team to the US project office for the RSI program is desirable. Foreign governments frequently follow this practice which gives their personnel an advantage over US counterparts who have not had the negotiation experience on the project. When problems arise under the project contract, foreign personnel are frequently able to recall interpretations and intent expressed by the parties during MOU negotiations. Without such information, US project personnel may find it difficult to defend the US point of view.
- o Copies of MOUs and other international agreements are filed with the United States European Command (APO 09128, New York). Many agreements are included in the State Department publication "United States Treaties and Other International Agreements." This publication is normally available in overseas legal offices and US diplomatic missions. Additionally, Military Assistance Advisory Groups, Naval Missions, and Joint US Military Aid Groups normally have copies of agreements for countries they deal with. Finally, the Office of the General Counsel, DOD, maintains a central repository of international agreements in accordance with the provisions of DODD 5530.3, International Agreements, 3 November 1976.

MEMORANDA OF UNDERSTANDING
LL 2

THE FORMAT FOR AN MOU COVERING A COOPERATIVE RESEARCH AND
DEVELOPMENT PROGRAM IS WELL ESTABLISHED

- o The topics discussed below are normally covered in an MOU for a cooperative R&D program, with the amount of detail varying with the circumstances of the specific program.
- o Reference to pertinent and existing agreements. Any existing agreements pertinent to the program or the MOU should be referenced. Examples of such agreements may include:
 - Patent interchange agreements
 - Security agreements
 - Previous research and development agreements covering the program area
 - Data exchange agreements
 - NATO agreements and their implementing agreements
- o Reference to controlling laws and regulations of participating countries. Any laws and regulations of the participating countries which are mutually agreeable should be referenced as binding on the agreement. Examples include those relating to:
 - Inventions of importance to national defense
 - Employee inventions
 - Import and export of equipment, machinery, and technical information

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

- Inspection
 - Standardization
 - Personnel agreements
 - Exchange of scientific personnel
- o Definition of Terms. All terms which may be misunderstood should be defined. Normally, the necessity of defining such terms will become apparent during negotiations or will be based on past experience with similar programs. The negotiating team is responsible for defining the terms to be included in the agreement. Since glossaries have been developed on previous programs, the team should review these for applicability. Also, NATO glossaries exist for military terms and terms commonly used in the areas of quality control and industrial property.
- o Objectives. The program objectives and scope should be identified. Because of the different kinds of international programs, a variety of objectives are possible.
- For conceptual R&D studies, a typical objective might be joint R&D of a system with emphasis on:
 - Achieving optimum level of standardization and interoperability
 - Maximizing level of commonality of training and logistics

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

- Most rational use of the respective countries' industrial, economic and technical resources.

- Maximizing fulfillment of operational characteristics desired by participating countries.

- For systems under advanced or engineering development, an objective may be the development and fabrication of prototypes with total NATO system standardization and interoperability. As the program progresses it may become apparent that the original standardization and interoperability objective cannot be achieved. The MOU may then need to be modified to concentrate on a revised objective of standardization and interoperability at the subsystem or component level. The modification should identify specific items which will be common, such as the engine or gun for a tank. The MOU may require one of the parties to develop a subsystem designed to meet the technical requirements of all parties. All parties would also agree to incorporate the subsystem if testing verified that minimum national needs were met.

- An MOU or the program covered by an MOU may be modified only to the extent specified by original MOU terms. Substantive changes to an MOU or its program must be made by formal amendment to the MOU executed at the same level as the original MOU.

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

- If a foreign-developed system is to be considered for adoption by the US, a producibility objective may be necessary. The objective would state that the US must be given sufficient information and data to determine that the system can be produced economically by US manufacturers. Data furnished should allow the US manufacturer to address in his analysis legal problems, production costs, additional development costs and operational and maintenance costs. The MOU coverage should also specify the cost/work sharing arrangements among the parties.

Organization and mission. The agreements normally will establish a management organization and define its authority to implement the program objectives. For example, the agreement might require establishment of an organization to approve system modifications and improvements which affect baseline configuration, to achieve and maintain a level of system commonality and interchangeability and to identify problems affecting the program and develop solutions. The agreement should specify the authority of the organization established. Countries may seek to protect themselves from what they consider to be suboptimal decisions by insisting on unanimous approval of decisions made by these management organizations. Failure to obtain unanimous agreement may result in deadlock which will eventually doom the program. Therefore, agreements

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

must specify a method to resolve disputes or deadlocks. This will require submittal of the issue for consideration to higher approval level, perhaps to the negotiators of the MOU. Procedures should be established to insure the prompt exchange of all technical, economic and military information. Finally, the lines of communication between project offices of the participating countries should be set forth. A single focal point such as the chairman of the management organization should receive all formal communications. Interrelationships between major participants in one cooperative R&D program are shown in Figure 5.

o Work and cost sharing. To the maximum extent possible, the responsibilities and obligations of the participating parties should be delineated, to include:

- Work tasks expressed in terms of manpower, development of specific items, conduct of specific research
- Cost contributions, including total and annual financial contributions
- Liability in the event of termination of a participant
- Offset purchasing agreements
- Currency utilized plus method of determining exchange rates
- Transfer of funds arrangement

The US may be unable to commit funds for the entire program period because of legislative funding constraints (e.g., the anti-deficiency act). Thus, a provision should specify that the agreement is contingent upon availability

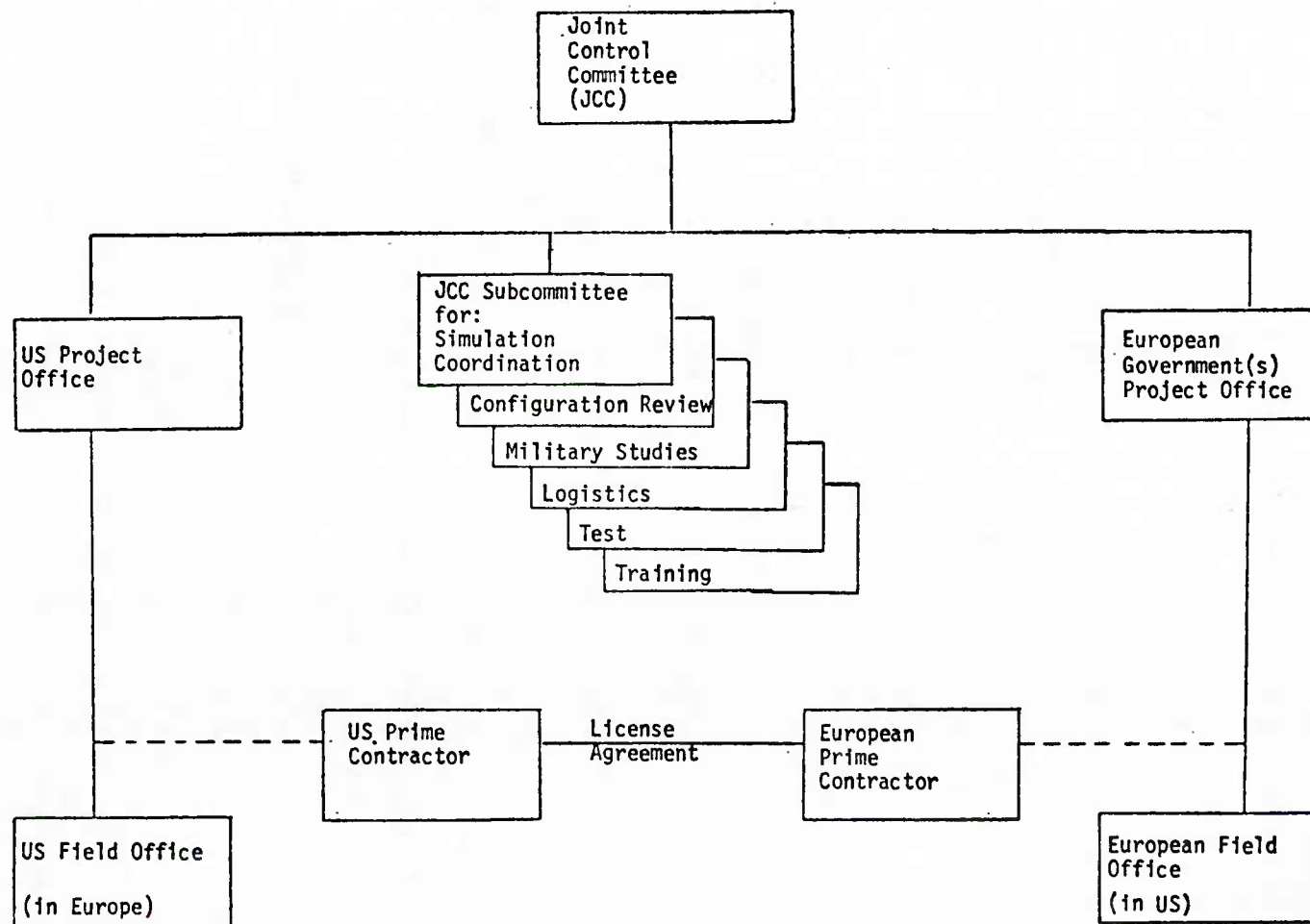


FIGURE 5. US/EUROPEAN COORDINATION STRUCTURE.

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

of funds. Similarly, foreign countries have funding limitations.

For instance, the Germans are required to put committed procurement funds into an interest bearing account; advance payment of a contractor prior to performance of actual work is prohibited unless there is an appropriate reduction in contractor payment commensurate with the interest lost. Accordingly, the Germans are not able to make funds available to the US on a US-awarded cost contract prior to actual contractor performance. Since US law prohibits the award of a contract without sufficient funds being available, the MOU with Germany would have to specify a method and time of payment that would satisfy the laws of both countries.

- o Administrative and other support. Frequently, parties to the MOU plan to furnish administrative and other support to each other. The basis and terms, such as cost determination, for furnishing the support should be spelled out. Such support may consist of:

- Government furnished equipment, facilities
- Support personnel
- Access to establishments
- Accounting, auditing, inspection assistance
- Translators

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

- o Reports. Quarterly and annual reports may be required. These may include summary reports, progress reports on completed work, detailed reports on specific areas, test and evaluation data, final reports, and reports on background proprietary rights. The MOU should specify for each such report:
 - The language of the report
 - Time of submittal
 - Number of copies desired
 - Submittal instructions
 - Restrictive markings
- o Rights to inventions, technical information and other intellectual property.

The MOU should specify the rights of the parties to use the information generated during the R&D effort for defense and other purposes.

 - Any data disclosure restrictions, such as disclosures to countries not party to the agreement, should be included. Unless the owners of the proprietary data are convinced that their technical information will be protected from unauthorized use and disclosure, their reluctance to participate could jeopardize an RSI program.
 - Each party may desire an initial report to disclose work accomplished and progress made in the program area prior to the initiation of

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

the cooperative effort. This will aid in differentiating background rights from foreground rights. Background rights are those generated at private expense prior to the contract award which commences the joint effort, while foreground rights are those which are generated subsequent to contract award. Under US regulations, the US Government acquires foreground rights to accomplishments generated under US-funded contracts. Contrarily, background rights must be purchased by the government at fair and reasonable prices. Therefore, background rights must be distinguished from foreground rights. However, foreign countries frequently do not distinguish between background and foreground rights. Furthermore, foreign law may require payment to the inventor for an invention relatable to company rights, which would include both foreground and background rights. Thus, an MOU provision which assigns different values for royalty payments dependent upon whether background or foreground rights are involved is virtually impossible to enforce if the foreign country does not distinguish between these rights. Any restrictions on the usage, disclosure or availability of information generated prior to the project and/or covered by proprietary data should be specified. Procedures for acquiring access to such information should be noted. To preclude future data acquisition problems, the MOU may specify that inventions and information will not be incorporated into a program unless all participants may obtain a license

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

or right to use the data. Related independent research and development effort which may impact the program should be covered.

- The terms and conditions under which the rights to data are acquired should be set forth. These may include sublicensing authority, territorial and grant aid sale rights, whether data is to be furnished on a royalty fee basis or reasonable term basis, and any minimum production commitments. Frequently, foreign contractors are paid a relatively low profit for R&D effort based on the fact that they are virtually assured of any resultant production contracts. If a second source is selected to produce the item prior to the award of production contracts to the original developer, the original company plus the individual patent holders are entitled to royalty payments. Similarly, the foreign government will be obligated to pay royalties for data needed for manufacture of the item by a US firm.

o Exchange of personnel and visits. Normally, personnel from each country will need to visit the other participating country(ies) on a cooperative program. The MOU should address:

- The extent of exchange or transfer of personnel, such as type and number of personnel (by functional specialty)
- Restrictions placed on personnel while visiting the other country, such

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

as disclosure of information and technical data reviewed or freedom of movement on post.

o One recent MOU specified that foreign observers were to be given complete freedom to observe the testing of their weapon system and to be immediately furnished copies of test reports. Thus the program testing was conducted in an open environment, lessening future protests of biased selection. Care must be taken to insure all arrangements are made to permit desired freedom of movement and observation for foreign contractor or other foreign personnel. Because the NATO Status of Forces Agreement does not provide coverage for such personnel, it may be necessary to place restrictions on foreign visitors witnessing tests of competing US-developed systems. These restrictions may be particularly applicable if competitive sensitive information might be revealed by such tests. It may be advisable for the participating countries to share the administrative costs and each country bear the full expenses of its own visiting personnel. An exception occurs when one nation requires the assistance of technical experts from the other nation, in which case the requesting nation will pay all costs for such personnel.

- Liability for injuries
- Security requirements

o Recoupment of R&D Costs. Although recoupment of nonrecurring R&D costs may be waived by the U.S. for particular sales that would, if made,

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

significantly advance U.S. interests in NATO standardization (Section 21(e)(2), Arms Export Control Act, PL94-329) and may be waived by other countries, an equitable basis is often established for recoupment of such costs by the participating countries. Normally, the formula for recoupment of R&D costs should be proportional to the participants' relative contributions or R&D expenditures. The MOU should specify if there is a ceiling on total recoupment, or if the rate per system will be readjusted based on demand changes to preclude recoupment of an amount exceeding expenditures. For example, the amount per system should be reduced if unanticipated commercial or third country requirements materialize.

- o Security arrangements. The MOU should specify provisions for classifying handling, storage, and transmittal of classified materiel and technical data. Additionally, the classification of the project and MOU should be decided.
- o Duties and taxes. The responsibilities, liabilities, and/or exemptions associated with duty and tax law relating to transfer of hardware and technical information should be addressed. Certain individuals are exempt from foreign taxes under the NATO Status of Forces Agreement.
- o Termination or withdrawal. The MOU will specify the procedure for termination of the MOU, along with the obligation of the parties which will continue

MEMORANDA OF UNDERSTANDING
LL 2 (Continued)

to be effective regardless of termination or withdrawal, e.g., protection of proprietary information and security provisions.

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- o Miscellaneous provisions. Miscellaneous provisions normally consist of
- the effective date of the agreement and its duration.

MEMORANDA OF UNDERSTANDING
LL 3

THE CONTENT OF A DIRECT PURCHASE MOU DEPENDS
ON THE FOREIGN GOVERNMENT ROLE

o An MOU between the US Government and a foreign government may contemplate that the US Government can make purchases directly from a foreign contractor. In such cases the MOU should include guidelines for contract terms and conditions to insure that the contract will be within the scope of the MOU. If the procurement is government to government, the MOU will serve as the basis for the issuance of a Letter of Offer and Acceptance (LOA). (See Contracts LL 1). After the LOAs have been signed by both parties, they become the contract with the terms of the MOU normally incorporated by reference. The contents of an MOU for government to government purchase are discussed below. Recognize that some of the terms and conditions may not be applicable to a government procurement from a foreign contractor.

o Introduction. This section may include information similar to that contained in the following areas of the MOU for a cooperative R&D program: reference to pertinent and existing agreements; reference to controlling laws and regulations of participating countries; definitions of terms; and the objectives of the program. (See Memoranda of Understanding LL 2).

- Definitions. Some terms, which may be overlooked, are of special significance to a direct purchase. They are:

- Related Supplies. Items such as associated weapons, support and

MEMORANDA OF UNDERSTANDING
LL 3 (Continued)

test equipment, spare parts, technical publications, and data.

- Contract. A contract between the foreign government and a foreign firm providing for work in connection with the program.

- Engineering Change Proposal. Procedure by which the US Government authorizes the foreign government to incorporate modifications in the weapon system.

- Objectives. The obligations incurred by the respective parties should be set forth. The following phrases are typical of what may be found in a direct purchase MOU.

- The US Government (USG) intends to purchase weapons systems from the foreign government, subject to Congressional authorization, availability of funds, and agreement upon terms and signature of the Letter of Offer by the Government.

- The foreign government obligates itself to sell to the USG the weapon systems, related supplies and services, as may be agreed upon in the Letter of Offer.

- This MOU sets out the procedures and arrangements established by the Governments for such purchase.

o Implementation. This section establishes authority, responsibility, and lines of communication between individuals (Project Manager, Contracting Officer, etc.) who are implementing the terms of the MOU.

MEMORANDA OF UNDERSTANDING
LL 3 (Continued)

- o Specifications and Acceptance. Some MOUs serve as an "umbrella" in that they deal with requirements without citing item specifications. Other MOUs will cite general specification requirements. To accomplish RSI objectives in either case, consideration should be given to citing specifications to be used as the baseline configuration. The MOU may state that engineering changes would have to maintain interchangeability with the baseline configuration. A procedure for handling engineering changes should be established since the foreign government will be acting as an agent for the US in dealing with the manufacturer. It may be advisable to require the foreign government to obtain an estimated impact (cost, time, performance) statement from the manufacturer prior to change implementation. Consideration should be given to authorizing the US government to deal directly with the manufacturer in obtaining such statements if incorporation of the change is deemed urgent. The detailed specifications and descriptions for individual orders of the weapon system and related supplies and services are usually set out in the LOA. This permits flexibility to incorporate the latest specification design changes. The MOU will specify the general inspection and acceptance procedures to be employed, citing any applicable STANAGS. In view of the administrative cost and effort associated with the US conduct of these functions, consideration should be given to using the foreign government's normal inspection and acceptance procedures.

MEMORANDA OF UNDERSTANDING
LL 3 (Continued)

- o Cost Reimbursements. The basis for cost reimbursement for functions conducted by the foreign government should be established. An agreement should be reached regarding recoupment of R&D costs. For instance, it might be appropriate to recover R&D costs through charges against hardware items, repair and overhaul work. Contrarily, no R&D cost recovery might be authorized against training courses or technical publications. The rate and basis (such as 6% of the aggregate price of weapons ordered under the LOA) should be given. Agreements associated with recoupment of R&D costs resulting from engineering changes should be obtained. For instance, the US Government should not be liable for R&D costs associated with changes:
 - Approved prior to MOU
 - Resulting from studies funded by the foreign government prior to the effective date of the MOU
 - Solely for the benefit of the foreign government
- o Contractual and Financial Arrangements. After the US specifies a firm buy quantity, the foreign government must give a budgetary estimate of costs, along with any supporting documentation. After the US accepts the Letter of Offer, the foreign government will negotiate the contract, using its normal contractual procedures and conditions. Any prohibitions against US disclosure of procurement information should be specified.

MEMORANDA OF UNDERSTANDING
LL 3 (Continued)

Since the US is obligated to pay the actual procurement, administrative and other costs incurred by the foreign government, provisions for overruns should be included. Finally, the method and terms of payment should be outlined.

- o Access to Facilities. The US will normally require access to foreign government and manufacturers/facilities to carry out the program.
- o Technical Data. Normally, the foreign government will agree to furnish data in its possession for operation and maintenance purposes, including illustrated parts breakdown, technical manuals, and training manuals. Oftentimes, the data furnished by the foreign government may be insufficient for US purposes. Thus, the MOU should provide for the negotiation of separate US government to manufacturer or manufacturer to manufacturer data agreements. The assistance of the foreign government on such negotiations may be beneficial, especially if the US desires a TDP sufficient for later competitive procurements in the US. A statement should be included that the MOU does not limit any existing US data rights.
- o Liability. If there are any unusual risks associated with the conduct of tests, inspection or other contract administration tasks, the liability of the parties should be delineated. Liability for third party claims should also be addressed.

MEMORANDA OF UNDERSTANDING
LL 3 (Continued)

- o Security. This section should be similar to the sections in the Cooperative R&D MOU dealing with the "Exchange of Personnel and Visits" and "Security." (See Memoranda of Understanding LL 2).
- o Support Program. Consideration should be given to the establishment of a jointly funded and managed support program. Such a program may be directed to maintenance of specification performance of the weapon system. It may include investigation and correction of problems encountered in operational service; improvement of reliability, availability, and maintainability; and development of repair procedures and funded damage limits. A management organization may be established for implementing the program. The authority, staffing, decision-making process and process for resolution of disputes of this organization should be detailed.
- o Miscellaneous. The effective date will be inserted in the miscellaneous section. Additionally, specific arrangements pertaining to third country sales by the participating countries should be included. One MOU which was reviewed had to be amended to provide for such sales.

LICENSING
LL 1

THE PROJECT MANAGER SHOULD INSURE THAT LICENSING AGREEMENTS
ARE CONSISTENT WITH RSI OBJECTIVES OF THE PROGRAM

- o Various types of licensing agreements are possible on an RSI program. If a US system is a candidate, the US Government or manufacturer may be the licensor and the foreign government or a selected foreign contractor the licensee (coproduction). Conversely, if a foreign system is the candidate, either the US Government or a proposed contractor can enter into negotiations for license rights (licensed production). Licensing agreements entered into between the US and foreign firms or governments, should be subject to the review and approval of the US Government prior to final signature. The bulk of the Licensing lessons learned pertain to licensed production rather than to coproduction.
- o Initiation of action on the licensing agreement should start early. Negotiating the agreement and obtaining necessary approvals may take months.
- o The project manager (PM) is responsible for furnishing complete information and advice to the negotiating team regarding desired license terms and provisions. Costly program delays and modifications are likely to occur if the proposed agreement must be modified to incorporate additional terms.
- o DOD policy related to licensing must be thoroughly understood by those responsible for licensing agreements. The policy is directed both

LICENSING
LL 1 (Continued)

toward exporting or importing technology.

- DODD 2000.9, International Coproduction Projects and Agreements between the US and Other Countries or International Organizations (23 Jan 74), authorizes licensed coproduction by a foreign licensee after a prototype has been selected for procurement. However, the license agreement may be entered into prior to prototype approval. This directive covers foreign production of US weapons, communications or support systems or military items.

- The Packard Memo (Subject: Licensing Agreements between US and Foreign contractors on Foreign Developed Items, 1 Nov 71) states it is DOD policy not to discourage or to inhibit industrial working relationships involving the import of foreign technology. The memo cited as the basis for having the US contractor a party to the license agreement on one of the programs studied. Although the memo encourages contractor to contractor license agreements, it does not preclude either government to government or government to contractor licensing agreements. Hence, the project manager must decide whether his program RSI objectives will be best met by having the Government or contractor enter into such agreements.

LICENSING
LL 1 (Cont'd)

- o Advantages and disadvantages of foreign government to US government licensing agreements.
 - Prior to entering into foreign contractor to US Government agreements, the US Government must determine whether some or all of the information and support necessary for the technology transfer is already available from the foreign government under an existing agreement. The new agreement should specify that the contractor will not restrict the foreign government from furnishing data in its possession to the US Government. This provision is needed since foreign countries generally do not acquire a right to pass their contractor's data rights to a third party, such as the US Government. For instance, Germany only reserves the right to use resulting R&D work, and allows the contractor to retain proprietary rights.
 - One of the primary advantages of such agreements is that the US Government is contracting directly with the developing contractor rather than indirectly through a foreign government. This helps eliminate misunderstandings regarding what data is required, how changes will be handled, and the desired sequence of delivery of data. Also, the US Government is fully cognizant of the program objectives, such as: (1) third country sales; (2) configuration management plans; (3) the US Government's ability to acquire data rights at no cost based on a separate MOU with the other government, who has the necessary data rights; (4) any existing resolution of US Government data rights.

LICENSING
LL 1 (Cont'd)

- Government to government licensing agreements are appropriate for government-developed systems which are produced at government-owned facilities.
- Such agreements may not be sufficient if a manufacturer has proprietary data for the required system. Since the data must ultimately be obtained from the developing contractor, entering into an agreement directly with the developing contractor helps eliminate third party communication problems, thus resulting in improved understanding of what is required and how changes will be handled.
- Although the programs studied involved no government to government licensing agreements, some of the MOUs required each country to provide license rights to the other. For instance, an addendum to a government to government MOU for one program specified that it is the intention of both parties that data and license rights on standardized items will be exchanged between the parties under fair and reasonable conditions. To accomplish this, the MOU states that each government, in its contracts, will include provisions requiring its contractors to enter into agreements for and to expeditiously transfer such technical data upon fair and reasonable terms and conditions. The MOU also recognizes that such data should be obtained by either the US or foreign government or its contractors directly from the foreign or US developing contractors.

LICENSING
LL 1 (Cont'd)

- o Advantages and disadvantages of foreign contractor to US Government licensing agreements.
- Such agreements preclude a foreign contractor from establishing a "sole source" US manufacturer of the required system as may happen under a contractor to contractor agreement which grants exclusive data rights. For instance, one licensing agreement between foreign and US contractors specified the licensee was granted the exclusive right to manufacture the system and the right to the exclusion of all others except the licensor to sell the system to the US Government. Thus, the US Government may lose control over the selection of its contractor and be obliged to contract with a US company selected by a foreign entity.
- Another advantage is that only one party, the USG, is seeking manufacturing rights. This eliminates the possibility of a competitive auction, which might occur if several firms were competing. Depending on the eagerness of firms to obtain the rights, such auctions could result in very unfavorable terms to the US, because the foreign firm is likely to grant rights to US manufacturer who is offering higher royalty payments.
- The disadvantage to this licensing arrangement is that the US becomes a third party in the data transfer to the US contractor. Hence, the US must rely on the licensor's certification that the TDP is adequate for competition. To "prove" the TDP for initial production contracts, either limited production runs, preproduction proposal evaluation (PPE) or foreign

LICENSING
LL 1 (Cont'd)

contractor support requirements may be required which could increase the overall cost of the program. However, the cost increases may be less than those associated with contract modification resulting from TDP deficiencies discovered after contract award.

- o Advantages and disadvantages of foreign contractor to US contractor licensing agreements.
 - As previously noted with respect to foreign-developed items, the Packard memo encourages such agreements. The primary advantage is that the two contractors are responsible for ironing out problems associated with the technology transfer necessary for the achievement of RSI objectives. The working relationship established between two or more contractors can be extremely important to the successful completion of a cooperative R&D effort.
 - One disadvantage is that the lack of US Government input or influence regarding the program objectives can result in a licensing agreement which will require costly modifications. A second is that the licensee may not be able to conduct an indepth analysis of the TDP prior to entering into the agreement because money is not available to purchase information from the licensor. Another is that a US firm may encounter more difficulties than the US Government in making known US specifications to a foreign contractor because of the security classification. Another is that there is no incentive for US contractors to vigorously negotiate royalty provisions since royalty costs normally pass on to the USG.

LICENSING
LL 1 (Cont'd)

- A final disadvantage is similar to one described for the foreign contractor to US Government agreements. Certain program cost increases are likely to occur regardless of whether the foreign manufacturer enters into a licensing agreement with the US Government or a US contractor. An example is the area of data transfer problems such as those associated with verification of the TDP. While the US manufacturer is responsible for solving these problems, it must be recognized that the US Government will be liable for the additional program cost if the prime contract is cost reimbursable. On the other hand, for fixed price contracts, the contractor will be reimbursed only for the portion of his efforts on those data transfer problems whose costs were originally reflected in his contract price.

LICENSING
LL 2

CERTAIN TERMS AND CONDITIONS ARE COMMON TO ALL LICENSING AGREEMENTS

- o Although the terms and conditions included in licensing agreements will vary, some are required in all agreements. The information that is presented below can be used as a basis for gathering information or forming a position on issues to be communicated to the negotiating team.
- o Effective date and duration of agreement. Excessively long agreement periods without justification should be avoided because they may create needless administrative problems and cost. For example, a 15-year agreement may require the submission of royalty reports several years after US production has ceased.
- o Authority and responsibility of each party. The US Government normally identifies the legal authority used to enter into the contract, such as Title 10 of the United States Code, Section 2386. Agreements should specify the responsibilities of each party in clear, concise terms. For instance, the US Government may agree to restrict usage of purchased weapons to defense use by the US Armed Forces. Similarly, the contractor may agree to provide technical data, data rights and technical assistance needed to enable the US to make weapons having the same performance characteristics and mechanical functions as those furnished under a previous contract. Furthermore, the licensor may agree to US selection of a contractor located in US territory or a specified third country, such as Canada.

LICENSING
LL 2
(Continued)

o Definitions. Because of language differences, problems can arise in interpretation of the agreement. Different meanings are often given to well-defined words and phrases, which may even have legal definitions. For instance, there is no legal definition of the term "know how" in Italy. To avoid misunderstandings, common terms should be defined. A list of some terms follows along with sample definitions or factors to be considered in developing a definition:

- US territory. A precise definition is necessary because questions may arise as to whether manufacturers in Puerto Rico or the US-administered territories, island possessions and protectorates of the US are eligible to produce system under the license.
- Military use. Identify whether weapons are to be used solely by DOD activities or whether agencies such as the Coast Guard or NATO military forces engaged in joint exercises can use the system.
- Design. The design configuration, including variations and adaptations, should be frozen to that existing on a specified date to preclude system design changes which would adversely affect RSI objectives or the logistic support of the item.
- Item. Item normally refers to individual components of the system, such as a tank's track or repair parts.

LICENSING
LL 2
(Continued)

- Improvement to the item. An improvement is any beneficial change or useful modification to item design. The definition should specify how changes which are beneficial to one party but not acceptable to the other party will be resolved. The obligations of the licensor and licensee for transmitting improvement data should be clarified.
- Royalty basis. The sales price is often used for royalty computation. This price should reflect the fair market value of items made by the licensee. The price may exclude such costs as non-recurring costs or transportation or packaging/packing charges, taxes, or parts purchased from the licensor. The definition should specify whether increases or deductions should be made for items changed, improved or replaced by licensor or licensee. In the event that the licensed item is a small component of a major system, the royalty rate may be based either on a small percentage of the sales price of the major system or on the sales price of the component part. Occasionally, the basis used for royalty computations may be other than sales price, such as recurring labor and material costs. Care must be taken to insure the basis is suitable for future US procurements. For instance, if competitive advertised procurement is envisioned, the contractor will not furnish a cost breakdown of item cost. Thus, if only recurring labor and material costs were used as the basis for royalty computations, it would be difficult to use the US Government's royalty payment liability incurred for different contractors as a bid evaluation factor.

LICENSING
LL 2
(Continued)

- Sold. Sold means actually accepted by the US Government.
- Repair parts. Identify as precisely as possible. If unknown, use statement such as includes parts, alternate parts, attachments and components of the weapon essential to its normal functioning. List any parts which are excluded.
- Technical data. A complete technical data package (TDP), either in English or metric measurement, necessary or useful in the development, design, manufacture, test, sale, operation and service of the weapon, including existing variations and adaptations thereto and future improvements, and (1) complete lists of parts, with material specification, chemical composition, and physical tests and full detail of heat or other treatment; (2) drawings with tolerances of all components, assemblies and accessories, tools, jigs, fixtures, gauges (It is necessary to specify that each of these data items is required to insure all the needed data is obtained. For instance, all data was not provided on one project because the license did not specify tooling data and the foreign contractor considered a printed circuit board as tooling); (3) operating sheets, sketches of operations indicating the plant equipment necessary; (4) information regarding inspection, quality assurance and functionability tests; (5) computer software; and (6) any other pertinent information. The format of the data (e.g., microfilm or reproducible on clear copy) should be specified.

LICENSING
LL 2
(Continued)

- Technical assistance. Because the difficulties associated with technology transfer are much greater when foreign enterprises are involved, the licensor should provide technical support and production know-how at his plant and/or at licensee's plant. Terms for such support will be separately contracted.
- Development testing/operational testing. These must be defined since foreign manufacturers may be unfamiliar with US testing concepts.
- Production. Terms to be defined may include producibility engineering and planning (PEP), initial production facilities, and initial production of hardware.
- "Know how." "Know how" may be defined as follows: all information including technical assistance pertaining to items, components or processes whether or not developed at private expense, now existing or as hereafter may be designed, developed and owned by contractor or by its licensors, including that existing in intangible form to be provided by skilled personnel of contractor or of its licensors, and including the whole body of undocumented knowledge that must be transferred to enable a third party to successfully integrate, use and manufacture, test and deliver an item in accordance with contractor's specifications and enable the government to operate, maintain and support the item, using the contractor's common tools, maintenance and support equipments.
- Exclusive or sole rights. The licensor may specify that the data rights be granted to the licensee to the exclusion of all parties other than the

LICENSING
LL 2
(Continued)

licensor and under certain circumstances the US Government. The granting of exclusive rights should be avoided if possible, since it has an adverse impact on future competitive procurements. Further, it precludes the exchange of data among NATO countries, thereby hindering the achievement of RSI goals. Additionally, the granting of exclusive rights normally results in higher royalty payments.

- o US Statutory requirements. Pertinent US statutory or regulatory requirements should be included in the agreement, such as: Officials Not To Benefit (DAR (ASPR 7-103.19) and Disputes (DAR (ASPR 7-103.12)). If the licensor objects to the inclusion of some of these provisions or if they are deemed to be inappropriate to the acquisition, a waiver might be appropriate. This requires a review by the legal office. Additionally, care must be taken to insure that only those special and general clauses required by law and regulation are included.
- o License grant terms. The terms may include: (1) irrevocable rights for manufacture of licensed items by the US Government or its contractors; (2) right to use current or future patents issued by foreign governments (licensors may grant an indemnity against future patent claims against the US or its contractors); (3) military use of licensed items throughout the world; (4) right to transfer licensed items without costs (including royalty

LICENSING
LL 2
(Continued)

free rights) to assistance (grant aid) countries and countries allied in combat; (5) third country sales rights.

- o Technical Data. The importance of technical data considerations cannot be overemphasized. Among the factors which require coverage in the agreement are the following:
 - Identification of specifications, drawings, and other data.
 - Delivery of data. Failure to deliver data in proper sequence can result in wasted effort and expense. A provision to correct and/or compensate for late or improperly sequenced delivery of data or incorrect data may be considered. Additionally, the licensor is normally responsible for obtaining clearances for export of data.
 - Warranty of data. The licensor's liability should be specified if the data is not sufficient to enable the licensee to produce the item.
 - Payment for other technical data costs. Since the royalty payments may only cover data rights, the licensor should be separately reimbursed for document reproduction, handling, and delivery cost.
 - Protection of technical data. The licensor may require limited or non-disclosure of proprietary data; if so, duration of limited disclosure or non-disclosure of data should be specified. The rights of support contractors to use data for analysis of tasks such as program planning and management risk analysis must be specified.

LICENSING
LL 2
(Continued)

- o Technical support terms. The types of terms which may be included are required access to licensor and licensee manufacturing plans; estimated and maximum technical assistance required; responsibilities for negotiation and payment for technical assistance cost; agreement as to payable cost such as travel per diem, and salary; and identification of personnel visiting each others' plants.
- o Royalty Provisions. Normally a licensee pays a royalty equivalent either to a set dollar amount for each system produced or an amount equal to a percentage of the selling price. Some of the factors regarding royalties that must be considered follow:
 - The currency in which the royalty is to be paid or date for determining exchange rates must be stipulated. The time of royalty payment should be stated such as date item is accepted. Conditioning the exchange rate to that existing on date of billing could create speculation as to billing date if the dollar was rising or falling versus the foreign currency. A ceiling, or time limitation, on royalty payments should be included.
 - The requirement for royalty reports should be covered. Licensees are required to furnish licensors royalty reports at stated intervals showing the number of systems produced to the royalty.
 - Provisions may specify initial or front money payment. Front money is the payment of a sum of money prior to the actual production of the

LICENSING
LL 2
(Continued)

systems with a reduced royalty payment rate for actual production units. Such payments should be avoided if there is a high level of uncertainty as to whether the system will actually be procured.

- o Engineering Changes and Improvements. Provisions should be included which specify obligation of each party to furnish all information and data relating to changes and improvements to the licensed item, time period for acceptance or rejection of change, and royalty rights and payment provisions associated with the changes. Such provisions help insure the maintenance of standardized or interoperable items since both parties are aware of the changes and can implement them in their production lines.
- o Licensors assistance. It is advisable to include provisions that the licensor will, as requested, use his influence to obtain required licensing agreements from his contractors, procure components and purchase parts from his normal subcontractors; and provide parts and materials he normally produces.
- o Miscellaneous. There are a number of other provisions which may require coverage.
 - Applicable laws and regulations.
 - Dispute procedures.
 - Assignment - The restriction of the right to assign the agreement without the other party's written consent should be specified.

LICENSING
LL 2
(Continued)

- Language - Governing language pertaining to agreement and related documents .
- Order of precedence of outstanding agreements.
- Procedures for modification of agreement.
- Security requirements.
- Responsibilities for taxes.
- Collateral agreements. Since under foreign law, the parole evidence rule may not apply to the agreement, the agreement may specify that the terms and conditions set out represent the entire agreement and neither party has placed any reliance on any representations, agreements, statements or understandings, whether oral or written, made prior to the effective date of the agreement.

LICENSING

LL 3

CERTAIN NATO PUBLICATIONS MAY BE USEFUL IN DRAFTING LICENSING AGREEMENTS

- o NATO publications are available which may aid in preparing licensing agreements. Some publications considered to be of particular value are listed below:

- NATO Drafting International Cooperative Research and Development Agreements. Provides a checklist, and explanation of the items therein, to be considered in drafting international research and development agreements.

- NATO, National Practices in NATO Countries Regarding Proprietary Rights in Cooperative Research and Development Programmes, (1978). Covers the philosophy of various NATO countries on topics such as: (1) rights to patentable inventions and technical data which are generated or used under a cooperative programme; including rights to foreground and background, inventions and technical data; (2) Cooperative Development and Production (CDP), including restrictions on CDP; rights for unilateral production, sale of equipment and recovery of R&D costs; and (3) acquisition by governments of rights and foreground patentable inventions under their R&D contracts and possibility of using them in the frame work of cooperative programmes.

- NATO, Military Equipment and Industrial Property Legislation, (1976).

Presents a comparative study of relevant laws, policies and regulations in NATO countries regarding Industrial Property Rights.

LICENSING
LL 3
(Continued)

-NATO, NATO Agreement on the Communication of Technical Information for Defense Purposes (1974), covers the analysis of the agreement and its implementation.

- These and similar documents may be obtained from:

Chairman, NATO Intellectual Property
Group AC/94
ATTN: Soteris Tsambiras
NATO Headquarters
Brussels, Belgium

LICENSING
LL 4

A WELL-NEGOTIATED LICENSING AGREEMENT IS A
KEY FEATURE OF AN RSI PROGRAM

- o The administrative lead time required to consummate a licensing agreement may range from 6 to 12 months or more. This time can be kept to a minimum with good planning, a competent negotiating team and provision of good information.
- o The team negotiating the licensing agreement should be composed of legal personnel and personnel from the project office. Team members should be selected to support the program objectives. For example, technical skills will be required if technology transfer is likely to be a key program objective. The team leader of the negotiations should be the best qualified individual.
- o Program objectives and other vital information should be made known to the negotiating team prior to negotiations. Of special significance is information as to whether or not technology transfer is likely to occur.
 - Technology transfer is likely to take place if a major state of the art advancement has occurred which is not likely to be duplicated by anyone else in the near future.
 - If the technology advancement is within the state of the art and likely to be duplicated by another firm, competitive procurement without

LICENSING
LL 4 (Cont'd)

technology transfer probably will be appropriate. In such situations, form, fit, and function specifications should be used.

- Technology transfer is normally undesirable if the item is highly competitive, technically unstable, or subject to frequent state of the art changes.
- o The value of the technology transfer in relation to the program's overall success must be established. For instance, normally every item can be reverse engineered; that is, broken down into component parts with drawings prepared from these parts. But there remains a risk that such an item will not perform as well as the original item. Therefore, if an item can be reverse engineered at \$100,000 and the risk of performance degradation is very small, potential payments under the licensing agreement should not greatly exceed \$100,000.
- o License agreements containing front money should normally not be consummated until a high degree of certainty exists as to the necessity of the technology transfer. However, to aid in the source selection process, it is advantageous to enter into license agreements without front money, because the willingness of the licensor to grant the necessary rights will be established thereby.

LICENSING
LL 4 (Cont'd)

- Disadvantages associated with agreements which do not include front payments are the foreign firm's reluctance to enter into agreements to furnish data or to permit US firms to examine data in detail prior to receiving payment.
 - Excessive front end RDTE cost loading may be avoided by eliminating front money and amortizing the license fee over the initial production quantities.
- o Information may be needed by the negotiating team regarding whether the technology transfer involves a trade secret or a patent. If a contractor refuses to furnish a process or data covered by a patent, the information can normally be acquired by obtaining a copy of the patent. 28 USC 1498 gives the US Government and its authorized contractors the authority to use patent data without being enjoined by a court. 10 USC 2386 gives the US Government the administrative authority to pay for the patent and data under a license. Most European countries have similar laws. Additionally, a patent only protects a manufacturer for use of the patent information in the country in which the patent is filed, or against import of an item manufactured with the patent information into that country. It is obvious that a contractor cannot be compelled to furnish a trade secret. If a contractor grants limited rights to a trade secret, the agreement should specify that such limitations end if the trade secret information becomes

LICENSING
LL 4 (Cont'd)

available from another source. In the US, contractors cannot be enjoined for patent infringements of US patents authorized by the government and necessary for contract performance.

- o Other information which should be furnished to the negotiating team consists of:
 - Potential export or third country sales rights. Foreign firms may be reluctant to permit third country sales because of a loss of sales potential and loss of commissions to sales representatives when the item is sold to a third country. Restrictions on third country sales rights may not apply when the licensed item is incorporated into a weapon system.
 - Configuration management plans.
 - Complete description of data requirements, including any sequential data delivery requirements. A provision such as liquidated damages for late delivery should be considered if delays are expected to increase costs.
 - Contemplated technical assistance requirements, including engineering service support and training courses.
 - Waivers permitted to US statutory requirements.
 - Definitions of peculiar terms.
 - Currency and anticipated economic (inflation or deflation) impacts. If budget constraints are tight and large budget changes unacceptable, it would be desirable to have payments made in US rather than foreign currency.

LICENSING
LL 4 (Cont'd)

- Future anticipated competitive requirements of the system or components.
 - The requirement to furnish the TDP to a support contractor.
 - Information or test data relating to system maturity and the likelihood of technical modifications.
 - Minimum US technical needs versus nice to have requirements.
- o In conclusion, the following words of caution are noted:
- Guard against disclosure to the foreign manufacturer of sensitive information known to the negotiating team, such as urgency of the program.
 - Agreements often set precedence; agreement to a high royalty percentage on one agreement may make it difficult to get a lower percentage on a second agreement with that contractor.
 - Close liaison should be maintained between the USG and the contractor who is negotiating the contractor to contractor agreements.

LICENSING
LL 5

LICENSING AGREEMENTS MUST BE APPROVED BY HIGHER AUTHORITY

- o Licensing agreements, whether involving the export or import of hardware or technology, usually require approval by appropriate government agencies. Two acts are discussed below. The Mutual Security Act of 1954 deals with both the export and import of arms, ammunition and implements of war. The Export Administrative Act of 1965 addresses exports only. Further, it pertains only to exports not covered by the Mutual Security Act.
- o The International Traffic in Arms Regulation (ITAR) is the State Department regulation which implements the Mutual Security Act. Section 414 of the Act provides that the President is authorized to control, in furtherance of world peace and security and foreign policy of the United States, the export and import of arms, ammunitions and implements of war, including the technical data relating thereto. The Act further specifies that all persons engaged in such trade must register with the appropriate Government agency. These functions have been delegated to the Department of Treasury for import of munitions list items including technical data relating thereto and to the State Department by Executive Order 10937 for export of such items. The munitions list is contained in the ITAR and includes 21 categories of articles such as firearms, artillery and projectiles, and ammunition. If an item is on the munitions list, a license is required for its sale, for a manufacturing license and technical assistance pertaining to it, and for the export of technical data related to it.

LICENSING
LL 5
(Continued)

To obtain a license for an item on the munitions list, the contractor applies to the State Department. The State Department requests DOD to formally comment within 20 days on the advisability of granting the license. Information used in compiling the DOD position is provided by the affected DOD component. Normally, the State Department adopts the DOD position.

- o As of the summer of 1978, the type questions being asked by DOD as a result of RSI are as follows:
 - Is the proposed item/data wholly or partially standard to the relevant Alliance? (NATO, Australia and New Zealand).
 - Is there an equivalent item that is wholly or partially standard to the appropriate Alliance, and, if so, is the proposed item interoperable with standard or equivalent items?
 - Would the purchase of the proposed item/data by RSI countries detract from RSI objectives? If so, to what degree?
 - Does the potential impact on RSI objectives justify nonconcurrence with the proposed sale? Explain in detail.
 - Is it in accordance with applicable standardization agreements (STANAGS) ratified by the US?
 - Other considerations, if any.
- o Under the Export Administrative Act of 1965, as amended by the Equal Export Opportunity Act, the Department of Commerce has licensing jurisdiction over

LICENSING
LL 5
(Continued)

all commodities and unclassified technical data except for certain specified items handled by other government agencies such as munitions items by the State Department or atomic energy material by the US Atomic Energy Commission. The Act applies to the export of commodities and technical data from the US, reexports of US origin commodities and technical data from a foreign destination, US origin parts and components used in a foreign country to manufacture a foreign end product for export, and in some instances, a foreign product produced as a direct product of US origin technical data. Export administrative regulations, issued by the Department of Commerce, prescribe licensing procedures for items under their jurisdiction. Controls on the issuance of export licenses are based on considerations of national security, the fostering of US foreign policy and international responsibilities, the necessity to protect domestic economy from excessive drain of scarce materials, and the reduction of the serious inflationary impact of abnormal foreign demand.

o Finally, it should be noted that the NATO countries similarly control the export of industrial property rights with defense implications.

CONTRACTS

LL 1

PROCUREMENT PLANNING IS ESSENTIAL TO PROGRAM SUCCESS

- o The information presented in this section generally may apply to either cooperative R&D programs or direct purchases. If the guidance is peculiar to one type, the discussion will so indicate.
- o The Source Selection Authority (SSA), the Source Selection Advisory Council (SSAC), and the Source Selection Evaluation Board (SSEB) should be appointed prior to the preparation of the request for proposals (RFP) since all either provide guidance or data to be included in Section D, Evaluation Factors For Award, of the RFP. DARCOM PAM 715-3, Procurement Proposal Evaluation and Source Selection, August 1969, lists the responsibilities of the SSA, SSAC, and SSEB. These include development of the source selection/proposal evaluation plans, establishment of evaluation criteria weights, development of instructions for content and format of contractor proposals, and evaluation and scoring of the proposals. For politically-sensitive high-interest programs, the SSA should be at a higher level than the DARCOM subordinate commands. The mission of the SSA, SSAC, and SSEB should be clearly defined. It may be desirable to assign additional duties to the SSEB, such as evaluation of the need for waivers to solicitation provisions and review of the program plan. However, additional SSEB duties must not interfere with the primary source selection function of the SSEB.

CONTRACTS
LL 1
(Continued)

- o The Project Office must furnish to the Purchasing Contracting Officer (PCO) comprehensive information for the proposed procurement. The issuance of an RFP by the PCO is one of the initial steps taken to implement the program objectives outlined in the MOU and/or licensing agreement. Inclusion of all appropriate provisions in the RFP is essential for effective program implementation. Misunderstandings resulting from either misinterpretation of an RFP provision or failure to include an important provision can result in unexpected costs and time delays.
- o The following paragraphs are indicative of the type of information the PCO needs to prepare the RFP.
 - RSI objectives. The emphasis to be placed on RSI objectives should be furnished. On a cooperative R&D program the contractor may be required to develop a system with emphasis on standardization and interoperability with the final objective of common configuration, training and logistics to the maximum extent possible within NATO.
 - Design/Cost tradeoffs. The RFP should reflect acceptable design tradeoffs between cost effectiveness and the objective of international standardization. The tradeoffs must be known so contractors can structure proposals in a manner which will optimize program objectives.
 - Minimum essential technical needs. The PM should make certain that the RFP specifies development of a system with the minimum essential need requirement of all participants. Frequently, the US or foreign country will

CONTRACTS
LL 1
(Continued)

insist on unique requirements such as maximum allowable fuel consumption for a specified cruising range for a vehicle. Nice to have features which may not be compatible with foreign technology should be eliminated or given less weight in the proposal evaluation scheme.

- Contract funding procedures. The basis and method for funding the contract should be agreed to in the MOU. Under the provisions of the Anti-Deficiency Act (31 USC 665(a)), the Surplus Funds Certified Claims Act of 1949 (31 USC 712(a)) and section 3732, 41 USC 11, the following restrictions are placed on officials of the US Government: may not commit the government to a contract that obligates it for expenditures or liabilities in excess of the amount of appropriation or beyond those contemplated and authorized for period of availability; may obligate funds only for expenditure within the limits and purposes of the appropriations annually provided; may not commit the government to any obligation prior to the approval of appropriations for the purpose. Some foreign countries have laws which do not allow advance payments prior to contract performance without appropriate consideration equivalent to interest lost due to the early payment. This impacts severely on RSI programs involving cost sharing between the US and the foreign government because foreign funds may not be available prior to contract performance. Thus, the PM must insure that sufficient funds are available prior to contract performance to cover both the US and foreign government share of the cost.

CONTRACTS
LL 1
(Continued)

-Support contractors. The need for a support contractor to provide assistance, such as specialized analytical tasks, must be considered. If a support contractor is required, the RFP should notify potential prime contractors so that proper provisions will be included in any resultant contractor license or other agreements. The RFP should set limits for disclosure and safeguarding of proprietary information to a support or third contractor. For instance, data usage by the support contractor may be restricted to the performance of an analytical assessment of the life cycle costs of various proposed design concepts. In order to properly safeguard proprietary information, the support contractor should be required to indicate in writing his willingness to comply with restrictions on the use and disclosure of such information.

- Witnessing of tests. The PM must decide whether contractors will be permitted to witness the tests performed by the government. Frequently, it is not acceptable to permit observation of testing on competitors' systems since competitive-sensitive information might be disclosed.

- Technical and managerial authority. The amount of technical and managerial authority to be given the prime contractor should be addressed. retention of authority by the government might result in reluctance or even refusal of a contractor to assume a contract with a cost incentive, such as a Cost Plus Incentive Fee (CPIF), because of his inability to control costs. The achievement of RSI objectives may place limitations on

CONTRACTS
LL 1
(Continued)

contractor authority. For instance, if it has been decided that US and foreign manufacturers are each to develop certain subsystems, the PCO must be given information by the PM regarding interface and interchangeability responsibility requirements for the sub-systems. Additionally, to further RSI objectives, if a US or NATO firm is selected as the lead contractor, selection of a NATO or US contractor respectively as a major subcontractor may be required.

- Milestone chart. A milestone chart is an invaluable tool. The chart coordinates the award and completion dates of the various contracts to be awarded throughout the life of the program. Foreign countries may not require competitive source selection, thus enabling them to select a contractor more quickly than the US. The chart then will highlight the need for the US Government to expedite its procurement procedures so that the performance period of both US and foreign contractors will be compatible.

- Tailoring US specifications. One of the primary barriers encountered by foreign bidders on US procurements involves solicitation provisions requiring products to conform to specified federal and military specifications. Recent measures may have helped eliminate some of these barriers; for example, the increased emphasis on use of commercial products. Guidance is available on the development and use of non-government specifications and standards. DAR (ASPR) 1-1201(a) permits the tailoring of specifications and standards to eliminate provisions not required for a

specific procurement and to insure only minimum needs are required.

- The impact of peculiar US legal requirements. There are many US legal requirements regarding safety or performance characteristics that may impact a foreign system's design. US pollution emission standards may affect noncombat vehicle systems. Similarly, US laws require dual safe and arm requirements for weapon systems, but there is no such European legal requirement. Foreign firms might be reluctant to redesign a standard commercial item to meet these requirements. In such instances, waiver of the provision might be sought for all competitors.

CONTRACTS

LL 2

A GOVERNMENT TO GOVERNMENT CONTRACT IS ACCOMPLISHED BY A LETTER OF OFFER AND ACCEPTANCE (LOA)

- o Normally, a Government to Government MOU references the applicable laws and establishes the basic guidelines and procedures which will govern the direct purchase of a foreign system by the US. The actual procurements are accomplished by a Letter of Offer and Acceptance (LOA). The US initiates the action by furnishing the LOA to the foreign government with the intended buy quantity plus desired terms and conditions. The actual contract results when the completed LOA is returned and accepted by the US.
- o Terms normally included in an LOA are: list prices, which are estimated unit prices for planning purposes; ceilings on monetary obligation; research and development levy; recommended delivery schedule; detailed item specifications; tax relief provisions; data rights (for instance, US rights to data needed for test and inspection procedures); inspection and acceptance procedures and responsibilities; incorporation of the MOU by reference; price variation. If terms such as inspection and acceptance are already covered by an MOU, reference to applicable MOU section may suffice in the Letter of Offer and Acceptance.
- o The LOA should specify that PCO approval is required if the actual monetary obligation incurred by the foreign government is expected to exceed the US obligation ceiling. Frequently, the LOA may require the US to make an advance payment exceeding a specified amount to the foreign government.

CONTRACTS

LL 3

CONTRACT AND RFP PROCEDURES FOR AN RSI PROGRAM DIFFER FROM THOSE OF A NORMAL US PROGRAM

- . o Documentation supporting off-shore procurements must be furnished to US overseas procurement offices if they are to make the actual procurement.
- . The US materiel command with technical cognizance over the system being procured is required to obtain the necessary waivers, deviations, sole source justifications and any determinations and findings (D&Fs).
- o Class D&Fs may be valuable in facilitating procurement actions. The MOU often will state that each country will follow its own procurement procedures. The main problem which may be encountered in an RSI program is the inability to define at the time of D&F preparation the extent of industrial competition, the type contract to be used and specific work to be performed. To resolve this problem, a class D&F which is authorized by DAR (ASPR) 3-301(c) should be considered. Such a D&F would give the purchasing contracting officer (PCO) authority to negotiate two or more contracts for the same program during a specified period of time.
- o Government-to-Government contracts may be advantageous for direct purchase of previously-developed foreign items. Although the majority of direct purchase contracts are US Government to foreign contractor, there are instances where government-to-government contracts may be advantageous. For instance, if the system is required in a timeframe which cannot be met

CONTRACTS
LL 3
(Continued)

by the foreign producer, the foreign government may be willing to divert systems from its inventory. Also, the foreign government has the administrative frame work established for placing and monitoring the contract, which may result in considerable administrative savings. Additionally, a foreign government may be able to obtain certain price advantages which the US Government could not obtain. For instance, some foreign governments place restrictions on the maximum amount of profit obtainable on a government contract. Normally, the manufacturer is entitled to maximize profit on commercial endeavors, which a US purchase direct from the manufacturer would represent.

- o To assure prompt and orderly disposition of disputes, contracts between the US and foreign governments should (where authorized) contain a stipulation as to which law will govern the contract; likewise (where not already provided for by law or regulation) provision should be made for final settlement of questions of fact. Where possible, no procurement should be effected which would leave the settlement of disputes only to diplomatic resolution.
- o Limited capacity of foreign firms may impact the procurement plan, especially for direct purchases of a foreign system. Foreign manufacturers often have limited manufacturing capacity. This creates problems when the US Government desires large quantities of the system. Thus, a procurement plan must consider the US delivery requirements versus the foreign firm capacity.

CONTRACTS
LL 3
(Continued)

- o Lead time for components needed for the direct purchase of a system may be lengthy. Authorizing the prime contractor to place separate orders for long lead time components prior to the award of the actual prime contract may be beneficial. Such authorization, however, may be used in the limited number of instances when the Government is negotiating with a sole source contractor and there is high probability that the prime contract will be awarded. These authorizations can be accomplished by issuing the prime contractor a purchase order if under \$10,000; by letter contracts limiting effort to only those specified long lead time items; or by advance agreements authorized by DAR (ASPR) 15-107, which authorizes certain pre-contract costs, such as those associated with long lead time effort.
- o Multi-year contracts may be necessary for direct purchases. Foreign firms are often unwilling to increase their capacity to meet large quantity US needs unless they are insured of continued production.
- * - Problems encountered in the administration of multi-year contracts may stem from the applicability of the original waivers and deviations to a subsequent program year. For instance, one waiver stated a dollar value estimate to cover the entire program in lieu of a specific quantity which was unknown at the time of waiver authorization. The resolution of the appropriateness of the waiver for subsequent program year requirements required considerable time. Thus waivers should be justified for the entire period of the multi-year contract.

CONTRACTS
LL 3
(Continued)

- o Before selection of a foreign system, a producibility study might be required to establish the feasibility of producing the system at a later date in the US. The program budget should include funds for such a study, the study to assess estimated production costs, data licensing problems, or cost of producing metric testing or gauging instruments. Problems likely to be faced by a contractor performing a producibility study include:
 - Unwillingness of some foreign subcontractor firms to release data without a license agreement.
 - Determining the basis for R&D recoupment.
- o Serious budgeting problems may result from the double effect of Economic Price Adjustment (EPA) provisions without a cost ceiling and the use of foreign currency for contract payment.
 - Because of the economic uncertainty associated with extended contract performance periods on direct purchases, foreign firms are insisting on EPA provisions with no price ceilings. Price increases are normally based on indices related to wages and/or raw materials. Caution must be exercised on RSI ventures to insure that the index is based on factors beyond the contractor's direct control. On one program, the foreign firm was one of the largest in the country, employing a significant portion of the workforce in the industrial area. Additionally, foreign firms are often tied closely to their governments. Both of these factors tend to lead to a labor wage index significantly influenced by the effects of that contractor's actions. Thus, escalation provisions based on the wage index for laborers in a specified industry in a country should be scrutinized.

CONTRACTS
LL 3
(Continued)

Finally, the use of material indices should specify the exchange rate to be used if the supplier of material is not located in the same country as the foreign prime contractor.

- Partially because of the weakness and instability of the US dollar in the mid 1970's, foreign firms insisted on payment in foreign currency. If the US dollar declines against foreign currency, the cost of the contract in US dollars will increase.

- Unanticipated high contract price adjustment associated with the EPA provisions coupled with a decline in the dollar exchange rate will result in a large program price increase. This could jeopardize the ability to procure the required quantity.

- o Presolicitation conferences and notices are valuable techniques to identify potential US contractors for RSI programs. Identification of qualified contractors is extremely important to the success of any program. In joint international efforts, there is a need to obtain the best firms because of the peculiar problems associated with RSI. Similarly, on direct purchase with licensed production, capable firms are needed to cope with the unusual number of problems associated with foreign technology transfer (see Technology Transfer LL 1).

- Presolicitation conferences and notices are authorized by DAR (ASPR) 3-106. The procedures are designed to permit the solicitation of

CONTRACTS
LL 3
(Continued)

preliminary information and to provide offerors an opportunity to express interest in the proposed project. Presolicitation notices describe the work to be developed and qualifications and criteria for contractor selection. Any prohibitions should be noted regarding the contractor's participation in future contracts, such as might result from license agreement restrictions placed on support contractors or conflict of interest considerations. The notice might request information relating to contractor management engineering and production capabilities.

- Permission to hold a presolicitation conference is required from a higher level than the purchasing contracting officer (PCO). The conference should be attended by the PCO and appropriate personnel from the project manager office. It is essential that all contractors receive the same information. Thus, there should only be one contact point, the PCO, for contractor communication. All contractors attending who express interest should be forwarded a copy of the solicitation.

- o DAR (ASPR) 15-107(g) notes that pre-contract agreements are important for pre-contract, royalty, travel, and bid proposal costs. For instance, pre-contract agreements may resolve the following problems.

- Reluctance of European manufacturers to permit US firms to review data needed for proposal preparation without a licensing agreement. US firms may not be able to obtain a license agreement without the payment of royalty front money. Such funding may be authorized in a pre-contract agreement.

CONTRACTS
LL 3 (Cont'd)

- Tendency of US firms to give a cursory rather than in-depth analysis of data. A pre-contract agreement may encourage US firms to devote adequate resources to proposal preparation on an RSI program.
- o As a minimum, the following factors should be considered in developing source selection criteria.
 - System maturity. Failure to recognize immaturity of a complex system will lead both to underestimation of costs, especially R&D cost projections, and to schedule slippages.
 - The management system of a potential contractor. Evaluation of a contractor's management system should use objective weighted selection criteria rather than subjective narrative ratings which are often "go" or "no go" decisions. Objective ratings may highlight attention on potential weaknesses of the contractor management organization.
 - Cost realism. If foreign firms participate in competitive negotiated procurements, the source selection evaluation should include analysis of the cost risk associated with no cost ceiling EPA and currency payment provisions.
- o Detailed draftmanship and meticulous review are required for the preparation of an RFP and contract with RSI implications. Differences in language, business experience, and conceptual understanding of the essence of a contract can degrade program accomplishment. Prior to issuance of the RFP,

CONTRACTS
LL 3 (Cont'd)

the PM should plan for extensive staffing at all levels of DOD involved in program implementation, to insure that all relevant problem areas have been considered and appropriate RFP provisions included. This will require an understanding by decision makers of the details of the program and of problems likely to be encountered. Possible problem areas might originate from differences between:

- The foreign and US TDP
 - The rights to proprietary data acquired by the US and foreign government in R&D government funded contracts
 - Terminology
 - Development, utilization, and logistic support concepts
 - US military standardized specifications and regulations versus those agreed to in STANAGs or used by foreign contractors
 - US and foreign country statutory requirements
- o During the evaluation and selection process, internal security must be stressed. The PCO should be the only contact point with the potential contractors. Information leaks by other personnel may result in an unfair competitive advantage to one party and possible protest. Measures should be instituted to insure security of documents and limited access to briefing rooms.

CONTRACTS
LL 3 (Cont'd)

- o Because the source selection process must be impartial in fact and in appearance, all actions must be carefully documented. The rationale for the selection decision including the evaluation criteria and weights, must be documented.
- o A plan should be developed early in the evaluation process for the debriefing of unsuccessful offerors. This will insure that weaknesses in contractor proposals or management capability will be documented during the evaluation process. The net result will be a well-organized debriefing in lieu of a hastily organized one. If a contractor understands the basis of rejection, he is less likely to allege bias. Additionally, failure to adequately justify the basis for selection to higher authority will result in repeated challenge of the decision. Such challenges will continue until the decision is properly supported.
- o Negotiating a contract with a foreign contractor is inherently different from negotiating with a domestic source.
 - The ability of the PCO and his team to negotiate a contract is dependent upon the information (technical, financial, etc) provided him by the project manager and by support personnel. Because of the different relationships between foreign contractors and their governments, the ability to obtain reports, especially audits, in a timely manner is a problem.

CONTRACTS
LL 3 (Cont'd)

- The negotiator should either have the ability to communicate fluently in the foreign language or have an interpreter who has an understanding of the program and the negotiator's objectives.
- The negotiated agreement must reflect complete understanding of the obligations of both parties. For instance, foreign contractors must understand that the data they develop under the contract must be suitable for various baselines, such as development and supportability. The impact of each clause peculiar to US contracts should be discussed with contractor management to eliminate future misunderstandings or non-compliance with such provisions.
- Negotiating team members should be available as needed for later support of the program. Experience gained during previous negotiations may help in future negotiations. Also, these members may be able to resolve contract interpretation problems based on their participation in the negotiations.

CONTRACTS

LL 4

THE UNIFORM CONTRACT FORMAT PROVIDES AN EXCELLENT STRUCTURE FOR THE RFP AND THE CONTRACT

- o Although the Uniform Contract Format (UCF) in DAR (ASPR) 3, Part 5, is optional for foreign procurement, most contracts issued by the US to foreign contractors do follow the UCF. The organization of the foreign contract may vary from the UCF; however, the contracting organization can easily extract applicable UCF sections and place them in the appropriate sections of the foreign contract. A description of major sections of the UCF follows.
- o Section A, Cover Sheet. This section normally includes the executive summary which describes the contract objectives. It gives contractor management and senior government personnel an overview of the total RSI program. If the contract is one of several for the system, the program milestone chart may be included to show how the particular procurement fits into the scheme for the overall program. For example, the contractor should know of special interface requirements related to the hardware he is to produce.
- o Section B, Contract Forms and Representations, Certifications, and Other Statements by Offerors. Several solicitation provisions in Section B should be reviewed for pertinence and impact on an RSI program. Among these are Equal Opportunity, Minority Business Representations, and Clean Air and Water Certification clauses.

CONTRACTS (Con't)
LL 4

o Section C, Instructions, Conditions and Notices to Offerors, Quoters.

-Several provisions normally included in US contracts may be objectionable to foreign contractors and should be considered for elimination. These clauses are discussed in "Contracts LL5."

-A statement should be included regarding restrictions placed on the presence of competitors at tests of equipment. Normally, this restriction stems from the possible disclosure of competitive-sensitive information.

-Other important information to include are proposal submission instructions, such as size, volume, and proposal language; debriefing procedures; and pre-proposal conference instructions. The pre-proposal conference should be scheduled so as to permit foreign contractors to attend. Conference instructions should address security classification requirements, the treatment of questions, definitions of terms, and special conference features.

o Section D, Evaluation Factors for Award.

-In an RSI procurement, it is critical to be impartial in evaluating proposals from both US and foreign firms. Thus, the relative order of the evaluation factors and the general scheme for scoring proposals should be made known to all contractors. Care must be taken to insure that all unique technical needs of the participating countries are considered as evaluation factors. The role of foreign evaluators should be addressed, and the methodology of final selection for award should be explained.

-In evaluating the management organization of a prospective foreign contractor, four factors have been identified as the most important. First, he must have an organization which permits flexibility in the operation of the program. Usually, no country has the unilateral right to make a decision; hence, management must be adaptable. Secondly, the contractor must have adequate facilities to fulfill program objectives. For example, adequacy of testing sites may be of primary importance. Third, the location of facilities should be investigated. The accessibility of the plant and the ability to communicate with the contractor on a daily basis may be factors for consideration. Finally, contractor management must exhibit a high level of cooperation, participation, and interest.

- o Section E, Supplies/Services and Prices. In addition to the normal line items for the hardware to be furnished, line items for special RSI requirements may be necessary. For example, technical support is normally needed in a technology transfer program. Engineering services provided by the European contractor may be essential for translating the TDP. Assistance may be required for the first production of the item by a US producer. Other forms of technical assistance include training courses, training manuals, and visual aids. Technical support requirements should be separate line items so that they can be properly priced.
- o Section F, Description/Specifications. The statements of work paralleling the line items of Section E are included in Section F. Descriptions of

CONTRACTS (Con't)

LL 4

contract requirements for hardware production, configuration control, logistics support and technical support are the types of work covered.

- o Section G, Packaging and Marking. No special requirements related to RSI programs were noted in the RFPs and contracts reviewed.
- o Section H, Deliveries or Performance and Section I, Inspection and Acceptance. MOUs which specify foreign government administrative services related to the delivery, inspection and acceptance of the system should be referenced. All applicable STANAGs for quality control and inspection are to be referenced.
- o Section J, Special Provisions.
 - To be incorporated here are license or MOU agreement guidelines on acceptable royalty terms, data rights (including third country sales), arrangements with third party contractors, furnishing of government test facilities or equipment, exchange of personnel and visits and duty and tax liabilities. It may be inappropriate to include provisions regarding penalties for late delivery of data, warranty of data or Buy American restrictions. The remedies available to the licensee under the license agreement should cover data delivery delays. Warranty of data provisions are often deemed to be unfair and unenforceable since the licensor cannot control the licensee's manufacturing techniques. Finally, when few systems

are to be fabricated, restricting procurement of parts and material to those produced in the US can be costly due to high tooling and start up costs.

- The language and law to govern the contract should be stated. Problems associated with making US law applicable to the contract are that US law must be proven as fact in foreign courts and that enforcement of US judgments against foreign firms may be difficult.

- o Section K, Contract Administration. The authority of any foreign government representative who may be performing contract administration services should be specified. A procedure should be established for monitoring dealings between US contractors and foreign representatives.

- o Section L, General Provisions. The general provisions and standard contract clauses should be reviewed for appropriateness to foreign procurements (see Contracts LL 5).

CONTRACTS
LL 5

US CONTRACT PROVISIONS MAY EITHER BE INAPPROPRIATE OR
REQUIRE TAILORING ON FOREIGN CONTRACTS

- o Numerous provisions are required in a solicitation/contract to fulfill US statutory requirements. Foreign firms may not accept contracts with such provisions. Factors regarding the use of these provisions comprise the remainder of this lesson learned.
- o The general provisions included in the RFP are influenced by whether US firms are included in the competition or are likely to be subcontractors if a foreign firm is selected. If US firms compete with foreign firms for the prime contract or if US subcontractors are likely, many clauses are mandatory. Some of these clauses are inappropriate to foreign contracts. In particular, the socio-economic clauses of DAR (ASPR)7-104.14(a) and (b), "Utilization of Small Business Concerns" and "Small Business Subcontracting Program" respectively, and the solicitation provision, "Pre-Award On-Site Equal Opportunity Compliance Review", are not applicable to foreign contractors performing outside the US or its possessions. However, when both US and foreign firms are competing for the procurement and the possibility exists of award to a US firm, these clauses must be included. Furthermore, these clauses are required if any part of the work will be performed in the US under a subcontract. One possible solution is to specify that the clauses will be waived if award is made to a foreign

CONTRACTS (Con't)
LL 5

firm for performance entirely outside the US. However, waiver for foreign firms only puts the US firms at a competitive disadvantage. On the other hand, compliance with these provisions by foreign firms may be costly and impact their competitive status. In such situations, waiver of the clauses for all contractors might be advisable. Such waivers need approval prior to release of the RFP.

- o Offset agreements may result in waiver of restrictive US statutory requirements. The US has entered into reciprocal procurement (offset) agreements with several foreign countries. Implementation of such agreements, which are covered by DAR (ASPR) 6-1310, often requires waiver of restrictive US statutory requirements. For instance, based on an offset agreement contained in a MOU dated 24 September 1975 between the United States and United Kingdom, the Secretary of Defense determined that the restrictions of the Buy American Act do not apply to all items of United Kingdom produced or manufactured defense equipment other than those items excluded from consideration by reasons of: protecting national security such as maintenance of the mobilization base; legally imposed restrictions on procurement from non-national sources. (See Public Policy LL 2 for an additional discussion of the Buy American Act.)
- o The two elements of the Priorities and Allocations System are applicable to DOD contracts placed with domestic US concerns. The Defense Material System assures preferential treatment of DOD orders and timely delivery

CONTRACTS (Con't)
LL 5

on the procurement of controlled materials (steel, copper, aluminum, and nickel alloys) and other articles containing these materials. The Priorities System under Defense Priority System Regulation 1 applies when contractors have difficulty in placing contracts and purchase orders or in obtaining required delivery of materials (other than controlled materials), components, or equipment in time to meet their production or construction schedules.

-None of the foreign contracts reviewed had priority ratings. Additionally, neither the contracts nor the DAR (ASPR) USEUCOM Supplement contain the DAR (ASPR) 7-104.18 clause, "Priorities, Allocations and Allotments," which incorporates the Priorities and Allocation System.

-If a foreign firm contemplates US subcontractors, it will be necessary to include priority rating provisions to preclude difficulty in placing orders with US firms and for assistance in improving deliveries of materials and equipment. Without a priority rating or allotment, foreign orders are considered in the same category as commercial work. All DOD rated orders take priority over commercial work. If a DOD agency places a rated order having a delivery requirement which conflicts with previously ordered commercial work, the rated order will generally take priority.

- o The application of Cost Accounting Standards (CAS) on foreign contracts has been noted as especially troublesome.

CONTRACTS (Con't)
LL 5

-Lengthy negotiations are often required to obtain acceptance of the CAS clauses by foreign contractors. The ability of the US Government to evaluate compliance with CAS standards may be hampered by the differences in accounting practices in foreign countries. Cost accounting practices in Europe vary substantially from country to country and contractor to contractor. Hence, total implementation may be economically impracticable.

-Due to these problems, waiver of CAS standards may be considered. However, obtaining waivers for foreign firms can be a time-consuming process and may give an unfair competitive advantage to foreign suppliers. It is suggested that guidance be obtained from higher level authority regarding the applicability of CAS standards to foreign contracts.

-A recent proposal by the CAS Board, if adopted, will make it easier for contracting organizations to exempt foreign contracts from certain CAS standards. The Board has proposed a limited exemption for foreign firms for each standard other than CAS Standard 401, Consistency in Estimating, Accumulating and Reporting Costs and CAS Standard 402, Consistency in Allocating Costs Incurred for the Same Purpose. Disclosure statements will not be affected. The limited exemption requires a determination in writing that the standard or standards are inappropriate. The determination would have to be made at the Secretary of Defense, Under Secretary of Defense or Assistant Secretary of Defense level.

CONTRACTS (Con't)
LL 5

- o Section 7 of the DAR (ASPR) USEUCOM Supplement has many general provisions which have been Europeanized for contracts between USEUCOM and European contractors. The clauses in the USEUCOM Supplement which have been modified have an "E" after the title. Because the clauses have been adapted for the special contracting conditions in Europe, it is suggested that all Army contracting organizations consider using them in contracts with European firms. However, since these clauses are not authorized for use by procurement activities outside Europe, a deviation to DAR (ASPR) will be required. An example of a Europeanized clause is the Disputes clause discussed in the following paragraph.
- o The Disputes clause is included in US contracts with foreign contractors. It is recommended that the USEUCOM version of the clause always be used. The USEUCOM clause states that the foreign contractor, if he wishes to appeal a decision of the contracting officer on questions of fact, must appeal to the US Army Board of Contract Appeals, Europe.
 - In most instances foreign contractors have come to accept the disputes procedure because the appeals board in Europe has established a reputation for fairness and impartiality.
 - However, legal experts and courts in certain European countries have questioned the legality of the disputes procedure. The contention is that the procedure is against public policy under the national laws of the country. As a result, foreign courts may elect to consider a claim against the US even though the Disputes clause requires submission of the claim to the appeals board.

CONTRACTS (Con't)
LL 5

-Foreign contractors and Governments favor using arbitration and conciliation to resolve disputes. Arbitration has not been acceptable to the US as evidenced by decisions of the Comptroller General who has consistently held that the express consent of Congress is needed for arbitration.

-Conciliation may be authorized for use in offshore contracts based on provisions contained in treaties or MOUs with foreign countries. Under the conciliation method, the foreign contractor requests a panel consisting of both US and foreign officials to hear the case. The decision derived by the panel is only a recommendation and is not binding. This procedure does not preclude appeal to Boards of Contract Appeals or foreign courts.

- o At times it may be necessary to tailor a DAR (ASPR) clause for inclusion in a foreign contract. This may require an agreement (MOU) with the foreign country or a deviation to the DAR (ASPR) 1-109. To forestall possible delay of award due to a disagreement over clause language, one contract contained a provision which said:

"All subcontracts issued under this contract to foreign firms (covered either by the identified (if negotiated) or future agreement (MOU)) which require a flowdown of specified ASPR provisions shall contain, in lieu thereof, a clause implementing

CONTRACTS (Con't)
LL 5

the identified agreement (MOU). Such implementing clauses shall be similar, but not necessarily identical to the clause identified in this RFP contract. However, the actual clause to be incorporated in any applicable subcontract shall be explicit in assuring compliance with the spirit and intent of the agreement (MOU)."

- o In summary, the PCO should assure that the RFP/contract does not contain needless and unenforceable clauses. It is also recommended that the RFP be subjected to legal review to assure the appropriateness of the clauses which are included.

TECHNICAL CONSIDERATIONS
LL1

EUROPEAN DESIGN AND PRODUCTION PHILOSOPHIES DIFFER FROM THOSE OF THE US

- o In general, mass production is not emphasized in Europe to the degree that it is in the US. This is primarily due to the fact that manufacturing in Europe is considered labor-intensive while in the US it is primarily capital-intensive.
- o Automation is the trend in US manufacturing while in Europe handfitting is still prevalent in smaller industries. This can impact severely on the capabilities of European manufacturers to meet US delivery schedules.
- o It must be recognized that some industries in Europe, for example, automotive and aircraft, are extremely progressive and can be considered as modern as any in the US. Production capacity may be no problem at all with these companies.

TECHNICAL CONSIDERATIONS
LL 2

ENGINEERING PRACTICES IN EUROPE VARY WIDELY FROM THOSE IN US

- o In general, standardization in Europe is practiced to a much lesser extent than in the US and the DOD. However, international and national standards are used in NATO and should be understood by US personnel. Of special significance are ISO (International Standardization Organization) standards and the DINs (Deutschland Industrial Norms). Recognition of national differences, early in the program, will insure appropriate planning, scheduling and funding of the technology transfer.
- o Indentured Drawing Lists (IDLs) are usually not developed by Europeans until the production phase of a program. An IDL is a drawing tree from the top assembly down to each bit and piece. The lack of IDLs creates two major problems for US licensees:
 - The IDLs are used to insure that drawings pertaining to various assemblies have been delivered by the licensor. Without them the licensee is uncertain as to whether he has received all the data which is to be transferred.
 - The US contractor also uses the IDLs to understand interrelationships between drawings and specifications. In the absence of IDLs the US contractor is required to create his own system.
- o Drafting practices vary widely from company to company in Europe. Therefore, it is important that drafting practices of the specific companies involved be reviewed and understood in advance of acquiring the initial Technical Data Package (TDP).

TECHNICAL CONSIDERATIONS
LL 2 (Cont)

- o Drawing quality may vary considerably. Early review and evaluation must be made in order to estimate the level of effort required to render the TDPs suitable for the planned procurement purposes.
- o European dimensional tolerances, in general, may be considerably tighter than US tolerances. Further, they usually reflect tooling tolerances rather than parts tolerances.
- o Manufacturing, test, and inspection specifications may be inadequate, completely lacking, or not accurately reflect the work on the shop floor. Effort required to correct these must be anticipated.
- o Reconciling the metric system with US production practices has not been as serious a problem as was anticipated. It is relatively easy to train an American to think metrically, but one should not expect him to use both systems.
- o The Europeans use the first-angle projection convention on drawings while the US commonly uses the third-angle convention. But the actual problems of translation and use associated with the differences have been minimal. This can be attributed to two major reasons. The first-angle projection has been retained, making the translation of the TDP more straightforward. The special attention and emphasis placed on first-angle projection have facilitated its utilization by US industry. Differences in the conventions are shown in Figure 6.

US (THIRD-ANGLE PROJECTION)

EUROPEAN (FIRST ANGLE PROJECTION)

125

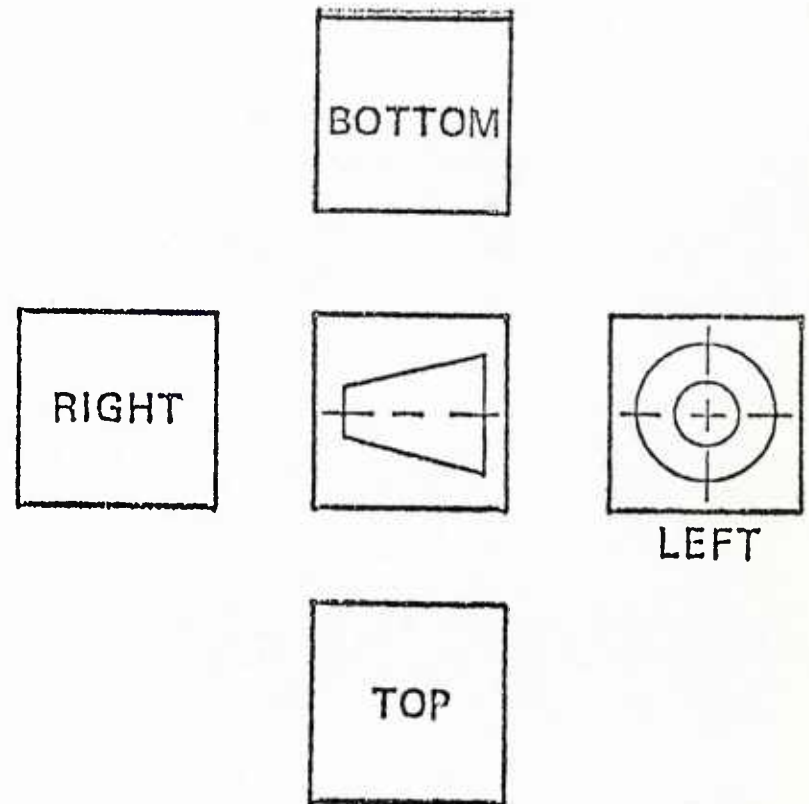
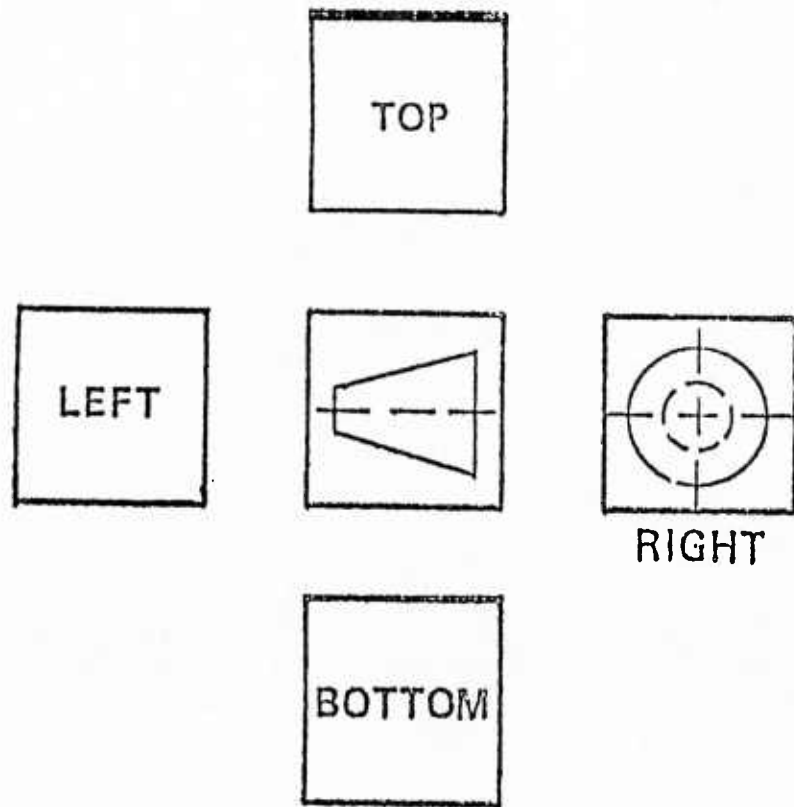


FIGURE 6.

DRAWING CONVENTIONS

TECHNICAL CONSIDERATIONS
LL3

NATO STANDARDIZATION AGREEMENTS (STANAGS), ALLIED PUBLICATIONS (APs) AND DATA EXCHANGE AGREEMENTS (DEAs) SUPPORT NATO STANDARDIZATION AND INTEROPERABILITY

- o Project offices should review STANAGS, APs and DEAs to determine if information exists which has applicability to their programs. The focal point in the Army for STANAGS, APs, and DEAs is the Office of International Research and Development (OIRD), Headquarters, US Army Materiel Development and Readiness Command (DARCOM).
- o STANAGS are agreements among several or all of the NATO members to adopt like or similar military equipment, ammunition, supplies, stores, and operational, logistic and administrative procedures. They can cover both materiel and nonmateriel aspects of military forces. Materiel STANAGS are implemented through DOD standards and specifications. The DOD Index of Specifications and Standards (DODISS) lists, as International Standardization Documents, unclassified STANAGS subscribed to by the Army. They may be obtained from the US Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120. Implementation for nonmateriel agreements will be in field manuals, regulations, circulars, pamphlets, handbooks, or other administrative publications. A complete list of STANAGS is found in the Index of Standardization Agreements which is a NATO classified document. Approximately 600 STANAGS are currently listed in the NATO index. STANAGS are specifically covered in AR 34-1, United States Army Participation in NATO Military Standardization Research, Development, Production and Logistic Support of Military Equipment, 5 Apr 74.

TECHNICAL CONSIDERATIONS
LL3 (Continued)

- o APs are NATO publications covering tactics, intelligence, doctrine and procedures. Of special interest to those participating in RSI acquisitions are the Allied Quality Assurance Publications (AQAPs). Like STANAGS, the AQAPs are listed in the DODISS as International Standardization Documents. (AQAPs are discussed further under the Quality Assurance (LL 1)).
- o NATO Data Exchange Agreements (DEAs) refer to the data exchange annexes of Mutual Weapons Development Data Exchange Agreements which have been negotiated between the US and NATO allies. The DEAs give details pertinent to the exchange of information in a specific field or area of interest. For example, it may be possible to obtain foreign test data under a DEA. A DEA covers what information is to be exchanged, by whom and by what means. Data Exchange Agreements (DEAs) are discussed in AR 70-33, Mutual Weapons Development Data Exchange Program and Defense Development Exchange Program, 11 Nov 76. Currently there are over 200 DEAs in effect with nearly 20 countries.

TECHNOLOGY TRANSFER
LL 1

SUCCESSFUL TECHNOLOGY TRANSFER REQUIRES
A FORMAL PROCESS FOR DATA CONVERSION

- o Strict procedures will be required for data receipt, control, translation, and conversion activities. The volume of the data and the potential randomness of its delivery make it imperative that a rigid control system be established. A central focal point should be designated to receive and record all incoming data.
- o Normally the US licensee will be responsible for the conversion of the Technical Data Package (TDP). Technical assistance in conversion should be furnished by the European licensor. The licensing agreement usually includes a stipulation that such assistance will be provided. A suggested practice is to have the European drafting room supervisors spend time in US contractor facilities to aid in the conversion.
- o A contract may be required for translation of the more complex documents. Specialty companies with language and technical skills are available. They normally will perform the service at a specific cost per word. Location of the translation contractor near the US licensee is desirable.
- o Less complex documents may be translated by drafting personnel of the US contractor. A Design Guide should be prepared to convert licensor standards to licensee standards. It should contain detailed drafting standard interpretations and conversion tables, standard specification conversions,

TECHNOLOGY TRANSFER
LL 1 (CONT)

material process and finish conversions, standard notes, and standard hardware and wire conversions. Military standards should be referenced where applicable. The Design Guide should be assigned a drawing number and placed under configuration control. The US licensee should be encouraged to develop and maintain a set of Project Standards as the transfer process proceeds. The policy is to solve each problem once only by recording and disseminating the solution in the Design Guide for others to follow.

- o To assure design commonality in the US and NATO systems, the European metric dimensions and first angle projections should be retained on the drawings with only the notes being translated. It is suggested that European line drawings be photographically transferred to a washable mylar master. The translated English notes can then be added. The US drawing should reference its European counterpart to provide design traceability.
- o Drawings and other technical documents should undergo a competent technical review after conversion and prior to release to determine whether all requirements are clear and understandable. If questions arise, clarification should be obtained by coordinating with representatives of the European licensor.

TECHNOLOGY TRANSFER

LL 2

PARTS SELECTION FOR THE US-PRODUCED SYSTEM IS A KEY FACTOR IN TECHNOLOGY TRANSFER

- o Total multinational configuration control is not feasible at the repair part or material level. But this does not mean that standardization of parts and materials is to be ignored. On the contrary, it is commonality of parts, materials and processes that will ultimately determine the degree to which the systems are alike. The formulation of a strategy for parts selection should be of primary concern. The project office must provide guidance to the US contractor or Army activity with the responsibility for technology transfer.
- o Standards must be defined against which parts comparisons can be made. The following classifications were used on a major program:
 - US Exact Equivalent Part - A part manufactured in the US that is an exact duplicate of its European counterpart.
 - US Near Equivalent Part - A part manufactured in the US that has all the required properties of its European counterpart but in some way is not identical (e.g., a US capacitor may have the same electrical properties but be slightly larger, or the material used in a US product may be slightly harder or possess a different finish than the European counterpart).
 - European Exact Part - A part manufactured in Europe which is identical to the part used in the European system.

TECHNOLOGY TRANSFER
LL 2 (Continued)

- o A recommended procedure for parts selection includes the steps listed below:
 - As European data is received, the responsible contractor or Government activity would screen the US system for US exact equivalents of the parts, processes or materials described in the data. If successful, the US drawing is so annotated.
 - If a US exact equivalent cannot be found, then a US near equivalent part would be sought. However, any such selection would need approval by the project office on a case-by-case basis.
 - As a last resort, a European exact part is selected if a US exact or a US near equivalent cannot be located. The project office again would have the final approval authority.
- o The process of identifying parts and components for use on the US system is painstaking. There are no shortcuts. Screening and searching for identical or near-identical parts is laborious work and requires great patience.

CONFIGURATION MANAGEMENT
LL 1

CONFIGURATION MANAGEMENT IS A PREREQUISITE FOR
ACHIEVEMENT OF NATO STANDARDIZATION AND INTEROPERABILITY

- o The depth and degree of configuration management (CM) planning are dependent upon the type of international program but the principles must be applied in every case. MIL-STD-480A, Configuration Control - Engineering Changes, Deviations, and Waivers, 12 Apr 78, should be the focal point for CM discussions with the NATO countries and contractors. It is suggested that it be referenced in the foreign contract. Since configuration control practices in Europe differ from those in the US, frequent discussions with the Europeans may be required in order to reach a common understanding of terms and requirements.
- o Configuration baselines should be established in accordance with the principles of AR 70-37, Configuration Management, 1 Jul 74. The product baseline should be as close to the product design of the European system as possible.
- o Proposed engineering changes should be classified as Class I or Class II as defined in MIL-STD-480. The class differences must be understood by all levels in both Europe and the US.
- o Procedures must be set up for initiating and processing changes. The authority to initiate change proposals must be specified, whether it be contractor or government. Agreement must be reached on procedures for the review and evaluation of change proposals. The guidance for evaluation is found in MIL-STD-480. It is particularly important to assess the impact of the change on logistics support and operational characteristics. Approval

CONFIGURATION MANAGEMENT
LL 1 (Cont)

levels for change proposals must be established both nationally and internationally. Agreement must be reached on plans for implementation of approved engineering change proposals because Europeans are inclined to implement at later effective dates than the US.

CONFIGURATION MANAGEMENT
LL 2

CONFIGURATION CONTROL IS REQUIRED ON COOPERATIVE R&D
PROGRAMS AT BOTH INTERNATIONAL AND NATIONAL LEVELS

- o A cooperative R&D program involving technology transfer and both European and US manufacturers has peculiar problems of configuration control. For a major weapon system, a joint or international control board cannot meet on every Class I change proposal that is submitted in Europe or the US. The process would be expensive and unmanageable with prohibitive delays in implementation. As an alternative in moving toward standardization, the US and participating NATO countries should agree to a set of selected components for international control. The rationale is that configuration control of a set of selected items is feasible and will insure a degree of international interchangeability between the US and NATO systems. On the ROLAND program items on the controlled list are known as the International Interchangeability (I^2) items.
- o Criteria that might be used for selecting I^2 components include:
 - Items that are interchangeable between all countries.
 - Items that are replaceable at the 2nd or 3rd echelon of maintenance.
 - Items that will be supplied as repair parts by all nations.The I^2 list should remain fluid and dynamic until the designs of the US and European systems are frozen. After an item is placed on the list, its drawings should be annotated to show that engineering changes may be made only after approval by a joint international control board.
- o The CM plan must include procedures for processing changes to any item on the I^2 list. The special characteristic of engineering change proposals (ECPs)

CONFIGURATION MANAGEMENT
LL 2 (Continued)

affecting internationally interchangeable items is that there must be unanimous agreement to implement among all nations to insure that standardization and interoperability are retained. The following describes how a proposed change to an I^2 item might be processed. If the change originates from a contractor in Europe, he may send the proposal to the US contractor(s) for an evaluation of the impact of the change on the US system. Each contractor will forward his recommendations to a joint control board composed of US and European contractor personnel. A joint engineering change proposal may then be prepared and forwarded to a joint configuration control board made up of Governmental personnel from the participating countries. In the event agreement is reached, the change will be contractually implemented both in Europe and the US. If a decision cannot be reached, the matter is referred to a higher level control committee. A change which originates in the US would be processed in a corresponding fashion. A suggested procedure for processing ECPs for I^2 items is described in Figure 7.

- o A special configuration control system is needed during the period when European technology is being transferred to the US and prior to final selection of I^2 items. This is because the European manufacturer may make engineering changes after the TDP has been provided to the US contractor. Any such changes must be evaluated for possible inclusion in

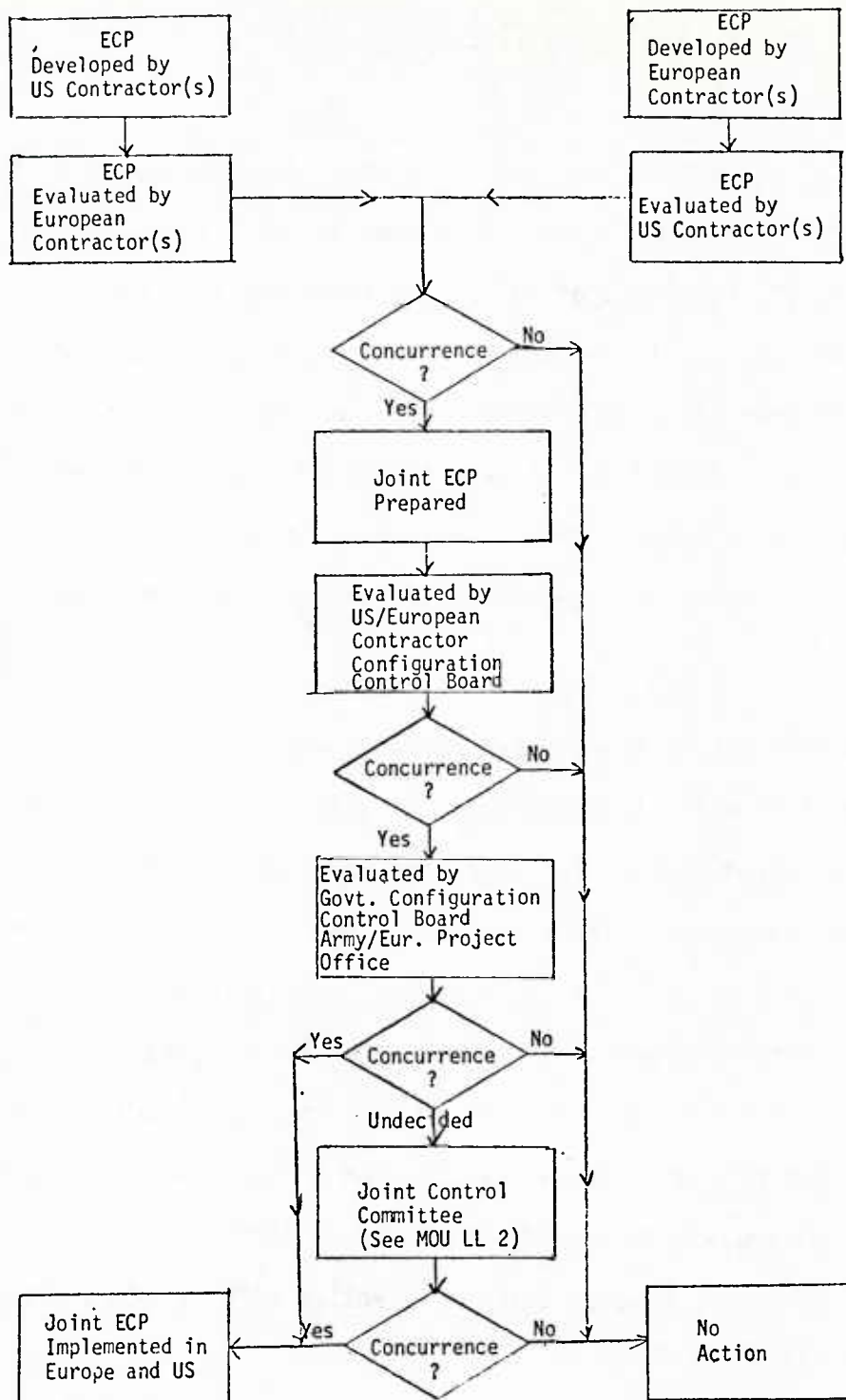


FIGURE 7. PROCEDURE FOR PROCESSING ENGINEERING CHANGE PROPOSALS (ECPs) TO I² ITEMS.

CONFIGURATION MANAGEMENT
LL 2 (Continued)

the US TDP. Hence, a configuration control system is necessary to deal with changes originating from Europe. As a general rule, a US decision will fall into one of three categories, either incorporate or reject, or hold until production. If the decision is to incorporate, the ECP is prepared in the prescribed MIL-STD-480 format and processed in accordance with the CM plan. A decision to reject requires concurrence of contractor management and the US project office. The hold decision means that the decision to accept or reject will be deferred until the item is in US production.

- o National control boards will be required for engineering change proposals which do not affect items on the international list. Nations may unilaterally decide to implement changes for parts and components in this category. In this case, the configuration control system should be essentially like that of a typical US program. Changes would be classified and evaluated in accordance with the procedures of MIL-STD-480. The originator of the change should furnish the change proposal to the other nations for evaluation, but acceptance or rejection is the decision of each nation. Engineering changes of a national type should be held to an absolute minimum, since each unilateral change may have an adverse impact on NATO standardization and interoperability.

CONFIGURATION MANAGEMENT
LL 3

A TAILORED CM PLAN IS REQUIRED FOR A DIRECT PURCHASE
PROGRAM ON WHICH US PRODUCTION IS ANTICIPATED

- o On a direct purchase, the US cannot control the configuration of items produced for any nation other than the US. For this reason, the information which follows pertains only to those items manufactured in a foreign country for delivery to the US Army. Obviously, the inability to control changes to systems produced throughout NATO is a hindrance to achieving RSI.
- o Configuration management on direct purchases from foreign sources is two-fold:
 - Configuration management of the item produced by the foreign contractor.
 - Configuration management of the item produced by a US contractor or an Army activity.
- o A functional or performance baseline must be established for the commodity or system. It is recommended that the baseline be that established in comparison testing. The comparison test is equivalent to Development Test III/Operational Test III which certifies that the item meets the requirements of the Army and the needs of the user.
- o A first article test of a foreign production item should be included in the contract to confirm that the item:
 - Meets the performance baseline established during comparison testing.
 - Meets the contractual requirements.
 - Is representative of production.

CONFIGURATION MANAGEMENT
LL 3 (Continued)

- o Engineering changes must be controlled for items manufactured for the US by the foreign contractor. This necessitates including in the MOU or contract the rules pertaining to change control. The level to which control will be exercised must be identified, for example, whether interchangeability with US-produced items is to be at the component or the repair parts level. Naturally, control at low levels results in increased costs, so the level selected must be economically feasible. Foreign contractors are required to have a change control program in accordance with MIL-STD-480 or the equivalent. The contractor's program, as a minimum, should include procedures for processing and classifying engineering changes, deviations and waivers. It is recommended that a Materials Review Board (MRB) be constituted to make decisions on minor nonconformances from the configuration identification. In most instances, no Class I engineering change proposals will be implemented on items produced by the foreign contractor for the US. Under any circumstances a contractual provision must be inserted which vests final approval of Class I proposals with a designated responsible activity of the Army.
- o A Configuration Item Verification Review (CIVR) must be planned and conducted to validate that the desired configuration is being produced and acceptance-tested to the requirements of the Product Configuration Identification (PCI). The metric system should be used when performing the CIVR.

CONFIGURATION MANAGEMENT
LL 3 (Cont)

- o The Product Configuration Identification for the licensed production in the US should be that established for the approved first article of the foreign production. The PCI will also be described by the technical data package (TDP) transferred under the license agreement.

QUALITY ASSURANCE
LL 1

PROCEDURES FOR PROCUREMENT QUALITY ASSURANCE
ARE COVERED BY NATO AGREEMENTS

- o Two STANAGS are applicable to procurement quality assurance - STANAG 4107, Mutual Acceptance of Government Quality Assurance, and STANAG 4108, NATO Inspection and Quality Control Requirements of Industry. The STANAGS have been implemented with guidance AQAPs.
- o The AQAPs and their counterpart US documents, current as of Summer 1978, are as follows:

<u>NATO</u>	<u>DESCRIPTION</u>	<u>US DOCUMENT</u>
AQAP-1	NATO Quality Control System Requirements for Industry	MIL-Q-9858A
AQAP-2	Guide for the Evaluation of a Contractor's Quality Assurance Control System for Compliance with AQAP-1	Quality and Reliability Assurance Handbook H-50
AQAP-3	List of Sampling Schemes used in NATO Countries	MIL-STD-105D (and others)
AQAP-4	NATO Inspection System Requirements for Industry	MIL-I-45208A
AQAP-5	Guide for the Evaluation of a Contractor's Inspection System for Compliance with AQAP-4	Quality and Reliability Assurance Handbook H-51
AQAP-6	NATO Calibration System Requirements for Industry	MIL-C-45662A
AQAP-9	NATO Basic Inspection Requirements for Industry	Standard Form SF-32, Standard Inspection Clause

QUALITY ASSURANCE
LL 1 (Continued)

- o The following AQAPs have been proposed but have not yet been issued as official publications.

<u>NATO</u>	<u>DESCRIPTION</u>	<u>US DOCUMENT</u>
AQAP-7	Guide for the Evaluation of a Contractor's Calibration System for Compliance with AQAP-6	Quality and Reliability Assurance Handbook H-52
AQAP-8	NATO Guide to the Preparation of Specifications for the Procurement of Defense Materiel	MIL-STD-961
AQAP-10	NATO Requirements for a Government Quality Assurance Program	Defense Logistics Agency Manual DSAM 8200.1, Joint Services PQA Manual

- o The AQAPs do not contain the exact requirements of their US counterparts. A discussion of the differences will be found in the publication, "Comparison of NATO Quality Assurance Documents," available from the Quality Assurance Directorate, Defense Logistics Agency, Cameron Station, Alexandria, Virginia 22314.

QUALITY ASSURANCE

LL 2

QUALITY ASSURANCE PLANS FOR FOREIGN PURCHASES MUST BE DEVELOPED AND IMPLEMENTED

- o Quality assurance planning is generally consistent with that conducted on US systems. Equally applicable to foreign purchases are the principles and policies espoused in AR 702-3, Army Materiel Reliability, Availability and Maintainability, 15 Nov 76; AR 702-9, Production Testing of Army Materiel, 7 Mar 77; and other product assurance regulations of the 702 series. Preparation of a formal Product Assurance Plan with milestones serves as a method of portraying and tracking significant events for a system acquisition. Furthermore, it is an effective means of disseminating information to all layers of management. Milestones to be scheduled and depicted include such events as dates for the pre-solicitation conference, issuance of letters of instruction, first article and comparison tests, and fielding plans.
- o A system "maturity" analysis should be performed. The "maturity" of a foreign system or its life cycle status will determine the required degree of quality assurance planning. Maturity of a system should be judged by its relative status when compared to the life cycle model (see DA Pam 11-25, Life Cycle System Management Model for Army Systems, 21 May 75). If it is "mature," it will be equivalent in DA terms to a Standard A Type classification. An "immature" system would fall within the development phase of the model. The "maturity" analysis must include an evaluation of safety, reliability, maintainability and other characteristics which may not be

QUALITY ASSURANCE
LL 2 (Continued)

emphasized in a foreign system. The "maturity" analysis is primarily based on results of tests performed on the system by the foreign contractor and the Army. As a result of the analysis, the US may determine that the item is ready for production with only minor system changes, such as colors and markings; or the US may determine that further testing and development is required before a production decision can be made.

- o Quality Assurance testing during production should follow normal Army practice for similar items. Tests to be performed are:
 - First article (preproduction testing or initial production testing)
 - Quality Conformance
 - Comparison
 - Interchangeability
- o The user, the US Army Training and Doctrine Command (TRADOC), must have an opportunity to evaluate the system for user satisfaction. Release of materiel to US troops must follow established Army policies and procedures described in DARCOM Regulation 700-34, Release of Materiel for Issue, 15 Jun 78.

TEST AND EVALUATION
LL 1

COMPETITIVE TESTING HAS BEEN UPHELD BY THE
COMPTROLLER GENERAL AS A LEGITIMATE METHOD OF SELECTING A SYSTEM

- o The Comptroller General (CG) in 55 CG 1362, 20 Aug 76, recognized side-by-side testing of US and foreign systems as a proper way of choosing a system to meet an Army need. The decision pertained to the Army selection of the Belgian MAG-58 machine gun. The CG made a number of significant findings which are summarized below.
 - The Army may make a preprocurement evaluation of competing foreign and US systems and may select the winner on the basis of the evaluation results. This excludes the selection process from procurement statutes and regulations.
 - The Army has a right to change the minimum needs established in the Required Operational Capability (ROC) on the basis of the test results. In effect, the CG stated that the Army is not locked into the minimum needs specified in the ROC if those needs were "based on minimal data and observations."
 - An agency may legitimately take cost into account in formulating minimum need. However, an agency is not required to purchase the lower priced item.
 - An agency may discuss requirements with potential suppliers. It may survey the market to ascertain what is available or encourage development of sources to compete.
- o In summary, the CG has taken the position that an agency has broad discretion in determining its minimum needs. He will not question the determination unless there is no reasonable basis for the statement of minimum need.

TEST AND EVALUATION
LL 2

FAIR AND OBJECTIVE TESTING IS ESSENTIAL
WHEN SYSTEMS OF SEVERAL COUNTRIES ARE COMPETING

- o The US Congress and the DOD depend heavily on test results in making decisions on US programs. Adding foreign systems to the equation lends greater urgency to valid and unbiased test and evaluation.
- o A lack of testing credibility can undermine attempts at international cooperation. At times in the past, Europeans have intimated their feeling that US testing has been biased to favor the US system.
- o Where it is appropriate, the test criteria should be revealed to all nations with candidate systems. The specific objectives of the test program should be clearly defined.
- o Test results should be interpreted by test and evaluation organizations, such as Army Materiel Systems Analysis Activity (AMSAA), Test and Evaluation Command (TECOM), and Operational Test and Evaluation Agency (OTEA).

TEST AND EVALUATION
LL 3

DUPLICATE AND REDUNDANT TESTING MUST BE AVOIDED

- o Testing is a very expensive phase of a R&D program (estimated as 10 to 15% of RDTE funds) and frequently results in destruction of equipment as when testing to failure. Hence, in spite of its importance, it must be conducted judiciously. Maximum use must be made of data compiled by foreign and domestic contractors.
- o Testing through computer simulation has become a sophisticated and effective means of reducing testing time and costs. Project office personnel and contractors should use simulation techniques on multinational programs.

TEST AND EVALUATION
LL 4

A JOINT TEST PROGRAM IS RECOMMENDED FOR
COOPERATIVE R&D WITH TECHNOLOGY TRANSFER

- o The European and US test programs should be integrated into a joint test program at an early stage. Integration not only reduces redundancy, it may permit an earlier production decision in the US. It may be necessary to negotiate an MOU between the US and other NATO countries for the joint test program. A joint test directorate should be established under the joint control of the US and NATO partners. It should be organized in such a way that the US and European elements of the directorate are mirror images of each other, each with test directors, test officers, and test analysts.
- o Developing a coordinated test plan for a cooperative R&D program is considerably more difficult than for a US-developed system. Terminology differences, geographic problems, the combining of two or more program schedules and other factors complicate joint test planning. Additional staffing time must be allowed. As might be expected, concepts of when to test, what to test for, who will test, how many to test and where to test differ from country to country. It is therefore likely that the Coordinated Test Program (CTP) for a joint program will be more detailed than that for a US-developed system. While European testing techniques and methodology may differ from that of the US, some of their data can be extrapolated for use by US decision makers; thus, the US portion of the test plan must be tailored to supplement European testing. For example, it may be necessary

TEST AND EVALUATION
LL 4 (Continued)

to add tests for electronic countermeasures, safety requirements, or extreme environmental conditions. This will require identification of voids in European testing for common requirements as well as US peculiar test requirements. Specific features of NATO standardization and interoperability which will be tested should be identified. For example, if interchangeability is to be confined to field replaceable modules, testing should insure that this level of interchangeability has been achieved. AR 70-10, Test and Evaluation During Development and Acquisition of Materiel, 29 Aug 75, and DA Pam 70-21, The Coordinated Test Program (CTP), 10 May 76, should serve as the basis for test program planning.

- o A definition of the test objectives is necessary for each part of the program. If the tests are specifically to verify successful technology transfer, this should be clearly stated in the plan. Additionally, in program briefings and presentations to Congress, the testing objectives should be emphasized. The concurrence of higher echelons in the objectives should be achieved. Differing test objectives can mean significant differences in the tests conducted. A misunderstanding between the General Accounting Office (GAO) and one Army program office resulted in a formal criticism of the Army test program (PSAD 78-16, B-163058 Mar 78). According to GAO, the tests would not result in assurance that the equipment would meet the needs of field troops. The Army answered that the tests were designed only to prove that the technology had been transferred successfully and that

TEST AND EVALUATION
LL 4 (Continued)

the system undergoing tests was essentially the same as the European system. Later tests would be conducted to insure the suitability of equipment for issue to troops.

- o In joint test planning, the availability of test sites is a particularly critical requirement. One of the earliest actions to be taken, after a delivery date for prototypes has been set, is to confirm specific US and European test sites.
- o There may be STANAGS and DEA's which relate to the program and these should be recognized. For example, STANAG 2138, Troop Trial Procedures-Combat, Clothing and Equipment may impact upon the test plan. In addition, a DEA may include test results which are available for US review.
- o It is imperative that the test data be accumulated on the current version of the European system. Accusations have been made in the past that test data are not up to date.

THERE MUST BE COMMON UNDERSTANDING OF TERMS

- o In discussing logistics in an international framework, there must be agreement and understanding as to the definition of terms to be used in the particular cooperative venture. The meaning of a given term is not always constant from one joint project to the next, since different nations and persons influence the meaning in use. In order to lay a basis for understanding the logistic lessons learned, conceptual meanings of some RSI terms are presented below.
- o Standardization.
 - Standardization of hardware implies that all NATO armies would be equipped with the same tank, the same personnel carrier, or the same guns.
 - Common, compatible, or interchangeable supplies, components, weapons, or equipment.
- o Interoperability.
 - The ability of systems, units, or forces to provide services to and accept services from other systems, units or forces and to use the services so exchanged to enable them to operate effectively together.
 - The concept of interoperability embraces standard ammunition sizes, standard fuels, communications compatibility and standardization of high-usage repair parts and components.
- o Standardization versus Interoperability. Basically the distinction is that standardization focuses on efforts to make future weapons and equipment similar whereas interoperability seeks to make dissimilar weapons or equipment compatible.

LOGISTICS
LL 1 (Cont)

- o Compatibility. The capability of two or more items or components of equipment or material to exist or function in the same system or environment without mutual interference.
- o Interchangeability. A condition which exists when two or more items possess such functional and physical characteristics as to be equivalent in performance and durability, and are capable of being exchanged one for the other without alteration of the items themselves or of adjoining items, except for adjustment, and without selection for fit and performance.
- o International Interchangeability. An item is internationally interchangeable between cooperating nations if it is exchangeable in form, fit, and function and retains at least the same level of performance it originally had. Variations in safety, reliability, maintainability, and other similar traits may exist, however.
- o Logistic Interchangeability. Logistic interchangeability of an item requires the following conditions:
 - Item can be used without restriction on the weapon system of any participating country, considering its technical characteristics of shape, adaptability, and operation (equals form, fit, and function compatibility).
 - A single catalog number can be assigned to the item regardless of country of manufacture.
 - Special tools, measurement, and control equipment, and the technical documents adopted in each country may be used equally in its repair; and

LOGISTICS
LL 1 (Cont)

- Any differences in reliability between the item as manufactured in the various countries have no bearing on supply levels.

(NOTE that all definitions of interchangeability apply to the component/subassembly level.)

- o Joint Logistic Support System. A joint logistic support system between participating nations for a weapon system requires identity of all repair parts, tools, test and measurement equipment, operator and maintenance training, manuals, publications, and maintenance standards, thus permitting a common stock and common repair/overhaul procedures.
- o Cooperative Logistic Support System. A cooperative logistic support system requires central management of supply and maintenance with variations by nation in items stocked, tools, test measurement and diagnostic equipment, training, publications, and standards.

LOGISTICS

LL 2

THE ACHIEVEMENT OF RSI MAY INCREASE US LOGISTIC SUPPORT REQUIREMENTS

- o Although a major benefit expected from RSI achievement is lowered logistic support resources/costs, this may be an invalid expectation on the part of the US. That benefits in logistics are expected is evidenced from the following:

- Wall St. Journal, 1 Feb 78, p. 44, states that the idea behind the concept of international agreement to interchangeable parts is to reduce battlefield repair-and-supply problems.

- GAO Report to the Congress on "Standardization in NATO: Improving the Effectiveness and Economy of Mutual Defense Efforts", 19 Jan 78, pp. 7 and 9, states that "the potential savings (from equipment standardization) are probably greatest in the logistics area. . . NATO's forces would be able to rely on replenishment from each other's stocks in an emergency. Repair of equipment and weapons would also be possible by eliminating spare parts differences, using similar tools, and familiarizing maintenance personnel with other nations' hardware."

Whether lowered logistic support costs for the US would result is questionable. If a total weapon system standardization in NATO is ever achieved, the US Army will need to develop, implement and manage two logistic support systems - one for the NATO-~~deployed~~ assets, another for assets deployed elsewhere. On the other hand, if total weapon system standardization is not achieved but instead some lesser degree of RSI such as interchangeable components, then not only will two separate logistic support systems be necessary for the NATO and non-NATO assets respectively, but the system for NATO-deployed assets might necessitate two logistic subsystems, one for the interchangeable components and one for US-unique components.

LOGISTICS
LL 3

WEAPON SYSTEM STANDARDIZATION
LEADING TO A JOINT LOGISTIC SUPPORT SYSTEM
IS UNLIKELY

- o For a number of nations to agree to procure a common standardized weapon system and thus make feasible the operation of a joint logistic support system is highly unlikely, and especially unlikely if the US is one of the nations. For the following reasons, total system standardization is considered improbable:
 - The specification of equipment capabilities is driven by each country's perception of the threat; this perception can vary significantly from nation to nation.
 - The mission specified for the system may vary from country to country, depending on national strategy and tactics.
 - Priorities of performance characteristics (e.g., survivability versus speed versus lethality) vary from country to country and these priorities influence design.
 - The global deployment of a US system may necessitate design differences from a solely European-based system.

LOGISTICS
LL 4

LOGISTIC INTERCHANGEABILITY OF COMPONENTS
MAY BE DIFFICULT TO ACHIEVE

- o Logistic interchangeability of a significant number of components of a weapon system or sub-system would make feasible a joint logistic support system for those components, i.e., common stocks and common maintenance procedures through depot level. However, such logistic interchangeability is considered to be well-nigh impossible to achieve unless production is restricted to a single source in a single country. The tendency in US procurements to "Americanize" foreign products is very strong, even when the item is procured off-shore and not manufactured in the US.
- o Some of the factors driving "Americanization" are the following:
 - Established US military standards for reliability and safety.
 - Producibility considerations if the item is to be manufactured in the US. European industry is labor-intensive, US industry capital-intensive. To fail to take advantage of the sophistication of US manufacturing processes results in unnecessary expenditure.
 - Internal destandardization considerations. The US may already have in its inventory a standard component (radio, machine gun) compatible with the weapon system.
 - The pressure to "Buy American" and the unavailability of a US equivalent of the foreign component/part.
- o A process of "de-Americanization" and resulting destandardization may occur when a US-developed system is adopted by or coproduced by other nations.

LOGISTICS

LL 5

INTERNATIONAL INTERCHANGEABILITY (I^2) OF COMPONENTS WOULD MAKE FEASIBLE A COOPERATIVE LOGISTIC SUPPORT SYSTEM (CLSS)

- o By definition (see Logistics LL 1), an item is internationally interchangeable (I^2) if it is exchangeable in form, fit, and function and retains at least the same level of performance it originally had. Since variations in safety, reliability and maintainability may exist, the internal design of the item is not necessarily standardized. By definitions again (see Logistics LL 1), a joint logistics support system for I^2 components is not possible whereas a cooperative logistics support system is feasible.
- o The question arises as to whether the non- I^2 components of the weapon system could also be supported by a cooperative logistics support system. Considerations here are that weapon system management and control might be facilitated if all components, I^2 and non- I^2 , are serviced through a single logistic support system; however, such support of non- I^2 components might well prove more costly than national unilateral support.
- o International agreements on I^2 components should specify the maintenance level(s) at which interchangeability may occur, the supply system level at which the item will be stocked and the methods of controlling and implementing future modifications to the I^2 items.
- o For maximum efficiency of a cooperative logistic support system, stringent configuration control of I^2 items is a must. Any changes affecting the form, fit, or function of an I^2 item must have joint agreement of all parties, and must not only be implemented by all parties but must be implemented

LOGISTICS
LL 5 (Cont)

on the same date by all parties. Otherwise, the item is no longer internationally interchangeable and I² component stocks of one nation cannot be used on the weapon systems of other nations.

- o Given a set of internationally interchangeable (I²) components and no cooperative logistic support system, exchanges of components between countries will require re-exchange before repair of a defective item can be effected.
- o Participation in a cooperative logistic support system appears more beneficial for the European members of NATO than for the US. The entire inventory of the European member could be serviced by the CLSS whereas the US inventory support would be split between the CLSS and the US Army support system, depending on deployment area and which of the two capabilities, I² components only or all components, was available under the CLSS.
- o As of the summer of 1978, no CLSS has yet been established between the US and any other country. This implies that a development effort of considerable magnitude would be mandatory before US participation in any CLSS. Funding considerations, operational procedures, responsibilities, data forms, communication channels, management controls and numerous other areas would need development and agreement.

LOGISTICS
LL 6

DETERRENTS EXIST TO US ARMY PARTICIPATION
IN A COOPERATIVE LOGISTIC SUPPORT SYSTEM (CLSS)

- o There exist two major deterrents to US Army participation in a CLSS with one or more other NATO nations. The first of these concerns legal and regulatory constraints on off-shore procurement; the second concerns constraints in license agreements between foreign and US manufacturers.
- o NATO Standardization Agreement (STANAG) 2135, Procedures for Requesting Logistic Assistance, 15 Nov 72, was designed to permit mutual logistic assistance between NATO nations under bilateral and multilateral agreements. DA legal opinion is that implementation of the STANAG would violate US statutes. (See Public Policy LL 3.) Earlier the US Army had considered that STANAG 2135 implementation was effected by AR 37-48, Accounting and Reporting for Materiel, Services and Facilities Furnished to Allied Governments and International Organizations Under Emergency and Combat Conditions, 4 Feb 74.
- o The Committee on Armed Services of the House of Representatives is considering H.R. 12837 (23 May 78), a bill to amend Title 10, United States Code, to authorize waiver of application to certain laws in connection with the acquisition of property or services from friendly foreign governments and international organizations to facilitate cooperation relating to defense equipment, and for other purposes. See Public Policy LL 3. Passage of this Bill would facilitate the establishment of cooperative logistic support systems between the US and one or more of the other NATO nations and would permit US implementation of STANAG 2135.

LOGISTICS
LL 6 (Continued)

- o Controls should be established by the US government to insure that license agreements between US and foreign companies do not explicitly or implicitly make infeasible US participation in a CLSS with one or more NATO nations. Certain existing license agreements do now inhibit such participation.

LOGISTICS

LL 7

THE NATO MAINTENANCE AND SUPPLY AGENCY (NAMSA) IS THE MOST LIKELY ROUTE FOR IMPLEMENTING A COOPERATIVE LOGISTIC SUPPORT SYSTEM

- o The NATO Maintenance and Supply Agency (NAMSA) has the mission of supply and maintenance support when two or more NATO countries having a common weapon system so request. NAMSA is thus the primary candidate for utilization as a cooperative logistic support system. (NAMSA is restricted from furnishing services on a given weapon system to a single nation.)
- o The United States underwrites a significant portion of NAMSA operations through its direct share of the administrative budget and through its indirect (through Grant Aid to NAMSA customers) contributions to the operating budget. NAMSA normal procedure in supply support is to procure stocks from the lowest bidder worldwide. Its normal procedure in maintenance support is to contract with commercial organizations in the various NATO countries.
- o NAMSA has been classified as a foreign entity to which US off-shore procurement constraints apply. This has prevented US Army utilization of NAMSA even in cases like the HAWK for which NAMSA provides logistic service to the European nations. H.R. 12837 (see Logistics LL 6) if passed will facilitate US utilization of NAMSA capability.
- o Before the logistic support concepts are fully established on any new US weapon system having NATO counterparts, the feasibility of NAMSA support should be thoroughly evaluated, particularly for supply and maintenance support above direct support level.

LOGISTICS
LL 7 (Continued)

- o Maximum US benefits from the use of NAMSA would be expected to accrue on those weapon systems which represent a direct purchase by the US Army of a European-developed system used by one or more of the European NATO nations.
- o To the degree that US Army, Europe (USAREUR) is limited primarily to Operations and Maintenance, Army (OMA) funds, the use of NAMSA would be constrained by OMA fund availability. NAMSA support of USAREUR equipment would impact the Direct Support System (DSS), stock fund replenishment, depot workloads and other international commitments. The administrative surcharge of NAMSA would mean that NAMSA support would cost more than US support at program manager level; but since not all of the US support costs are accounted for at program manager level, NAMSA support could possibly cost less overall.
- o US participation in a CLSS through NAMSA raises the question of how initial requirements for weapon system support hardware such as special tools and test sets will be computed. If maintenance support is to be provided by European contractors, the US Army requirements for such items should decrease. Yet considerations of stability and continuity of European-contracted support as well as considerations of redeployment of units out of the NATO sphere complicate decision-making.

LOGISTICS
LL 8

THE WEAPON SYSTEM DEVELOPMENT PROCESS DIFFERS
BETWEEN THE US AND THE OTHER NATO NATIONS

- o The weapon system development process as practiced by most European NATO countries does not provide for the tight government monitorship exercised in US developments. The European development process normally entails contractor "tight hold" of all design and logistic support implications until such time as the design is frozen; design freezing may not occur until some significant period of time has elapsed after fielding of the system.
- o Little priority or attention is accorded logistics planning and long-term support requirements in the foreign development process. The US Army policy of integrating life cycle logistic support considerations into the materiel acquisition process so as to influence system design and insure maintainability appears to have no counterpart in European developments.
- o Before any decision is made to directly purchase or coproduce a foreign-developed system, a preliminary logistic support analysis (MIL-STD-1388-1, Logistic Support Analysis, 15 October 1973) should be performed to insure that effective and efficient logistic support is feasible.

LOGISTICS
LL 9

LOGISTIC SUPPORT CONCEPTS DIFFER BETWEEN THE US
AND THE OTHER NATO NATIONS

- o The maintenance concept for European systems normally entails contractor support of all maintenance during initial fielding and of maintenance at echelons above direct support during the entire life cycle.
- o The foreign concept of maintenance repair is to perform it at a high level, namely the prime manufacturer or depot; this concept is feasible for a European nation because weapon system use is expected to be limited to one country and the contractor is physically close. The US maintenance concept dictates repair at the lowest practical level because of world-wide system deployment.
- o The foreign provisioning and replenishment concepts are based on yearly or multi-year requirements whereas the US concepts are based on reorder points and economic order quantities derived from considerations of shelf life, multi-echelon stockage policies, and mobilization requirements.
- o The European procedure for implementing modifications/changes is normally to hold such changes until a specific future date when all accumulated modifications/changes will be made at one time. The US Army procedure is more likely to be implementation immediately or as soon as possible, depending on the urgency of the modification in terms of safety and mission effectiveness. This variation in concepts must be recognized when techniques for configuration control of I² items are addressed.

LOGISTICS
LL 10

AVAILABILITY/APPLICABILITY OF LOGISTIC SUPPORT INFORMATION
ON FOREIGN SYSTEMS IS QUESTIONABLE

- o Until system design is frozen, it is unlikely that adequate information will be available on which to base logistic support planning for supply, maintenance, support and test equipment, manuals and publications, personnel and training, facilities, and transportation.
- o Even after system design has been frozen, much data necessary for planning logistic support may be unavailable because of proprietary rights. Parts usage data is often considered proprietary; lack of this data may affect supply support planning and provisioning. Technical data to include specifications and drawings may be considered proprietary; lack of this type data may severely impact the development of US maintenance capabilities at all echelons.
- o Stubborn resistance or downright refusal may be encountered in response to requests for technical data; often such data is considered proprietary even when developed using government funds. The foreign government may be able to force the manufacturer to release data to it for defense purposes but not for export sales.

LOGISTICS
LL 10 (Continued)

- o Little or no technical data may be available without a license agreement between the foreign manufacturer and some US firm; even with license agreements, all technical data may not be released; moreover, what data is released may be severely restricted as to how it may be used; the result of these considerations may well be that the US is constrained to dependence on the foreign manufacturer for certain supplies or services.
- o Technical data may be unavailable because it is undocumented; hundreds of small subcontractors may be involved in a foreign weapon system production and may lack adequate documentation of products and processes.
- o If the contract for a US purchase is directly with the foreign producer, without foreign government involvement, information on foreign military logistic experience with the item as well as operator and maintenance publications and manuals may be unavailable.
- o The extended use of contractor support and the concept of high-level maintenance imply the non-applicability of foreign logistic support concepts, training materials and publications to US use. Even if applicable, translation will be necessary. This is true even if the source nation is England since significant terminology differences exist between the United States and England.

LOGISTICS
LL 11

INTEGRATED LOGISTIC SUPPORT (ILS) PLANNING FOR A
FOREIGN SYSTEM MAY BE MORE DIFFICULT THAN FOR A US-DEVELOPED SYSTEM

- o Because the European NATO nations do not subscribe to the basic four-echelon maintenance concept of the US Army and because deployment of US materiel is world-wide, the US Army must necessarily and unilaterally develop a national logistic support system for any European-developed weapon system it adopts.
- o If a cooperative logistic support system is agreed upon and implemented by the US and one or more other NATO nations, then to the national logistic support system must be added a system for the US assets deployed in Europe.
- o The logistic support system for the European-deployed assets may need to be fragmented, depending on whether the cooperative logistic support system is designed for the total weapon system, for one or more major assemblies, or for a set of I^2 components only.
- o The non-applicability of European logistic support concepts to US Army equipment and the non-availability of technical and other data imply the need for reverse engineering and extensive weapon system testing to develop an adequate data base for ILS planning.

LOGISTICS
LL 11 (Continued)

- o Any attempt to shortcut ILS planning for a foreign weapon system adopted by the US is likely to backfire and result in serious support problems, degradation of readiness and unanticipated support costs during the operational phase of the life cycle. Sufficient funds and personnel resources must be made available to properly perform the ILS planning. Strict adherence to the ILS guidelines and procedures of the regulations listed below is recommended. To bypass or consider unnecessary any step in ILS planning as prescribed in AR 700-127 and in DARCOM Supplement 1 thereto is unwise without first seriously addressing the question of whether or not the particular step is inapplicable. Sections V (Plan for Personnel and Training Requirements) and VI (Plan for Logistic Support) of the Outline Development Plan and the Development Plan, as prescribed in AR 70-27 should be prepared as early as possible and should be continually updated.

DOD Directive 4100.35, Development of ILS for Systems/Equipment,
1 October 1970

AR 70-27, Outline Development Plan/Development Plan/Army Program
Memorandum/Defense Program Memorandum/Decision Coordinat-
ing Paper, 17 March 1975

AR 700-127, Integrated Logistic Support, 11 April 1975

DARCOM Supplement 1 to AR 700-127, 20 June 1977

DA Pamphlet 11-25, Life Cycle System Management Model for Army Systems,
21 May 1975

MIL-STD-1388-1, Logistic Support Analysis, 15 October 1973

MIL-STD-1388-2, Logistic Support Analysis Data Element Definition,
15 October 1973

LOGISTICS
LL 12

US PURCHASE OF AN "OFF-THE-SHELF" FOREIGN ITEM
RAISES SPECIAL LOGISTIC SUPPORT CONSIDERATIONS

- o The purchase of an "off-the-shelf" foreign weapon system means the loss of three to four years' of normal ILS planning time and the compression of ILS planning into the production and deployment phase. It is therefore extremely important that all ILS planning be performed as expeditiously as possible and that initial reliance be placed on contractor support. Order of preference for contractor support is full US contractor support first, a consortium of US and foreign contractors next, and full dependence on foreign contractors last.
- o Top priority at project start should be given to selecting a US contractor to perform engineering services, particularly maintenance engineering analyses, level of repair analysis, and logistic support analyses, and to develop the maintenance allocation chart, training materials, and technical manuals.
- o The foreign manufacturer(s) should be strongly encouraged to set up a US subcontractor with the capability to supply support/repair/modify/overhaul his system during the initial fielding period.
- o Adequate data for planning initial and follow-on provisioning may very likely be unavailable since parts usage data is often considered proprietary; this data lack is more certain to occur when the US contracts directly with

LOGISTICS
LL 12 (Continued)

the manufacturer rather than through the foreign government. Reverse engineering and extensive tests may be necessary to compensate for this lack.

- o A surveillance program should be instituted by the US in the manufacturer's plant to insure that no deviations from agreed upon design specifications occur during production runs for the US. Otherwise, logistic support of the inventory becomes unduly complicated.
- o If initial logistic support is to be furnished by the foreign manufacturer, recognize that the availability of necessary parts, supplies and modification kits may depend on the capability of hundreds of small subcontractors, that restricted parts availability means the US will be competing not only with foreign military supply organizations but also with the weapon system manufacturer, and that very long turn-around times for repair/maintenance may be experienced, particularly for those assets not deployed in Europe. Since European industry is labor-intensive and labor unrest is fairly widespread, the continuity of foreign contractor support may be broken; additionally, the dependability of production sources in Europe will be tied to the US/foreign government political relationships.

LOGISTICS
LL 12 (Continued)

- o It is unwise to try to cut costs on provisioning quantities for items produced by foreign subcontractors; these subcontractors may represent small businesses with limited capacities whose major product is not the item in question.
- o In establishing the training plan for maintenance personnel, consideration should be given to contracting with the foreign manufacturer for in-plant training. Subsequent transfer of such trained personnel must then be avoided.

LOGISTICS
LL 13

NATO STOCK NUMBERS WILL FACILITATE SUPPLY SUPPORT

- o Efficient supply support requires that a NATO Stock Number be assigned every part/component of a weapon system. The foreign manufacturer(s) should be monitored to insure that he takes expeditious codification actions for all weapon system parts/components not yet codified. STANAGs 3150/3151, Codification of Equipment - Uniform System of Supply Classification/Item Identification, 27 March 1972, represent agreement by NATO countries on military application of the NATO codification system. The nation in which an item is produced is responsible for its codification even if the item is not used by its own services. To accomplish codification, each NATO country has its own National Codification Bureau.
- o Efficient supply support of a foreign system/subsystem requires that some method be instituted whereby foreign manufacturers can publicize part stock number changes as they occur.

COPRODUCTION
LL 1

PREREQUISITES FOR SUCCESSFUL COPRODUCTION ARE
SYSTEM MATURITY, STRONG PROGRAM MANAGEMENT
AND MULTINATIONAL EMPATHY

- o A successful US program must precede a multinational coproduction program. System maturity is a prerequisite. Performance claims for the US system must be backed up by valid and reliable test data.
- o Strong program management is necessary by the involved parties. Financial and schedule crises will occur requiring immediate response and positive solutions.
- o The US project officer and prime contractor must have multinational empathy. They must be sensitive to the customs and cultural conditions in all the countries participating in the program. They must be prepared to present alternatives that can lead to effective compromises.

THE CONSORTIUM METHOD OF MANAGEMENT HAS INEFFICIENCIES

- o Initially two consortiums were formed in Europe to conduct the NATO Basic HAWK program.
 - The NATO HAWK Production and Logistics Organization (NHPLO), with a Board of Directors (BOD), was a consortium of the Governments organized to execute the financial and procurement functions. The US was not a voting member of the BOD. Thus, the US could not participate fully in the decision-making process which created a degree of resentment on the part of the other members. The NATO HAWK Management Organization (NHMO) was the administrative and management arm of NHPLO.
 - A consortium of industrial firms, SETEL, was organized to execute the production functions, such as allocation of the production to countries and firms. The industrial firms were the National Prime Contractors (NPCs).
 - A third organization, known as the MANDATE was set up to perform systems engineering functions. For all practical purposes, the primary responsibilities for technology transfer and configuration control rested with the MANDATE.
- o SETEL, the prime contractor of the program, was composed of five major industrial firms (from five different countries) who were competitors in Europe. Critics have maintained that such a group could not manage effectively. Conflicts of interest would tend to work against cooperation. Others maintain that it would have been impossible to organize a consortium

COPRODUCTION
LL 2 (Continued)

whose members were not competitors to some extent. At any rate, SETEL functioned as originally organized for the length of the Basic HAWK production. The question is how did it perform. In certain areas such as looking after the financial interests of the NPCs, SETEL had an excellent record. On the other hand, SETEL was less successful in planning and controlling production in Europe. The program was beset with production delays and cost growth. A truly effective program management organization would have been more positive in taking early corrective action to resolve the many problems encountered during the program. The displeasure of the various governments with SETEL probably accounted for the NHMO decision to bypass SETEL for the purchase of repair parts. In summary, SETEL has been criticized for its lack of initiative in managing the Basic HAWK. As subsequent developments with the HAWK European Limited Improvement Program (HELIP) have demonstrated, it is unlikely that a consortium of European prime contractors like SETEL will be attempted on future coproduction programs.

- o The agreements entered into for the Basic HAWK coproduction program were a Technical Arrangement Agreement (similar to a MOU) and the licensing agreement.
- o The Technical Arrangement Agreement was between the US and the participating governments. The US essentially agreed to furnish the production rights and furnish technical assistance. Other features of the agreement were

COPRODUCTION
LL 2 (Continued)

related to balance of payments, offsets, repartition of technology within the consortium and financial arrangements dealing with the roles of Raytheon and the US. The negotiation of these features was complex and consumed many months. Even today allowance must be made for slow and painstaking negotiations of MOUs. There are apparently no shortcuts.

- The licensing agreement was between Raytheon and SETEL. No obvious problems were noted.

- o Personnel and financial statistics on the original program are revealing and should be useful as guidance on similar programs. Over twice as many personnel were devoted to technical problems as to management issues. Similarly, twice as much money was spent on technical matters as on management functions. It becomes obvious then that the pragmatic day-to-day engineering and technology issues were the major concerns of the program.

COPRODUCTION

LL 3

EXTENDED NEGOTIATIONS MUST BE EXPECTED IN REACHING COPRODUCTION AGREEMENTS

- o On the HAWK European Limited Improvement Program (HELIP), the final agreement was not signed until five years after initial discussions began. The reasons listed below have been cited as contributing to the delay. Note that the first two conditions still prevail and may hamper other coproduction efforts.
 - Military needs were more demanding in some countries than in others.
 - Cost and economic differences among nations had grown since the original HAWK agreement.
 - Every decision made by the NHPLO, the government consortium, had to be unanimous. Each participant had veto power.
 - Two additional countries, Denmark and Greece, joined the consortium as members.
 - The European participants were considering a European-developed radar and computer to be integrated into the HAWK.
 - The Europeans, obviously disenchanted with SETEL, were insisting on a single prime contractor responsible for all aspects of the program.
- o The HELIP agreement between the US and NHPLO includes the following features:
 - Granting of production rights and technical assistance.
 - Disclaimer of responsibility of the US Government for the data and documentation provided by US contractors under direct agreements with NHPLO.

COPRODUCTION
LL 3 (Continued)

- A. European contractor is currently attempting to hold the US responsible for alleged defects in the TDP.
- Costs to be reimbursed to the US, such as those associated with reproduction and transmission of US-owned data and with technical assistance. Especially significant was the requirement for Europeans to pay nonrecurring R&D costs. Unlike the basic HAWK, the improved HAWK was still in the R&D phase.
 - Designation of responsibility for implementing and coordinating actions related to the agreement.
 - Procedures, rights and responsibilities regarding patent applications or inventions, production rights and licenses, and sale or transfer to other governments.
 - Operational and logistic interchangeability of the materiel to be produced.
 - Data flowback provisions regarding inventions generated in the European program.
- o Surprisingly, the NATO consortium, NHPLO, chose the US contractor Raytheon as prime contractor for the European HELIP with maximum responsibility for carrying the program to fruition. The ground rules established by NHPLO for the prime contract which was executed in 1974 are shown below.

COPRODUCTION
LL 3 (Continued)

- The price was to be the lowest possible, with the US product price as a goal.
 - A firm fixed price production contract was required. European contracts typically include labor escalation clauses.
 - The contract could not contain provisions for changes in exchange rates.
- o Further, the agreement between Raytheon and NHPL0 also covered the rules for subcontracting on the program.
- Industrial allocations were established.
 - Competitive solicitations were required from firms of the participating countries for the allocated portion.
 - Italy insisted on maximum balance of payments. Italy's share was 28%; hence, 28% had to be contracted with Italian industry.
 - Overhaul and conversion had to be accomplished in two places, one north of the Alps, and one south of the Alps.
 - Payment is in the currency of the country in which the work is performed.
- o The licensing agreement was negotiated by Raytheon with NHPL0. The agreement was structured to cover immediate R&D know-how, prototype production know-how, and production know-how in the event of a favorable production decision.
- o The following interesting observations resulted from the management and partitioning of the program by the US prime contractor.
- The 50% allocated to the US was concentrated on the most critical item from a reliability and performance point of view, the missile. Production for

COPRODUCTION
LL 3 (Continued)

this system which comprised 50% of the effort would take place in the US. The 50% European share would include all ground equipment production and ground support equipment overhaul and conversion.

- The US prime contractor chose European firms to solicit which were known to have excellent reputations. It should be noted that the US prime contractor has a wholly owned subsidiary in Paris and is quite knowledgeable about European industry. However, the prime contractor did not always have the ultimate choice of selecting the European firm. Throughout the early phases of the program, the various NATO governments were attempting to balance technology and payments decisions through negotiations. The European contracts were usually awarded by NHPLO which generally participates in contract negotiations. The European contract format and structure are used.

COPRODUCTION

LL 4

COPRODUCTION REQUIRES WORKLOAD APPORTIONMENT AND CAREFUL SCHEDULING TO EUROPEAN INDUSTRIAL PLANTS

- o The goal of a coproduction program is to develop a capability to produce the system in Europe. However, limited purchases of components from the US may be necessary for the following reasons:
 - The quantity desired is too small to justify the cost of tooling up in Europe.
 - Delays are associated with creating European sources.
- o In the case of limited purchase, it is desirable to have US Army readiness commands act for the foreign government in the source selection. This assures proper control over quality, price, and delivery.
- o Decisions pertaining to which country and which firm will receive contracts to manufacture the European system are for Europeans to make. The US Government and contractor should be limited to the role of technical advisors. Helping the Europeans to analyze the amounts and kinds of technical know-how needed is appropriate. But production allocation decisions are economic and political, and must be made by the NATO countries.
- o Scheduling of multinational programs is an enormous task. Sequencing the product of contractors from several countries into end item assembly requires detailed planning and the use of sophisticated scheduling techniques. Upon request, the US should be prepared to offer technical advice on network models and analysis, such as PERT (Program Evaluation and Review

COPRODUCTION
LL 4 (Continued)

Technique) and CPM (Critical Path Method). In the past, contract delivery schedules have created problems. Schedules appear to have been established more by negotiation than by consideration of the specific date the product would be needed for the next order of assembly in the production process. While schedule negotiations are necessary, an overemphasis can create unrealistic and costly delivery schedules. The network scheduling techniques previously mentioned can provide a more rational basis for schedule decisions.

- o Measurements of progress concern timeliness, quality, and costs. Establishment of checkpoints and agreement on the feedback mechanisms are tedious and time-consuming. Yet they are necessary to insure that management receives status reports upon which vital decisions must be made. Again the US can provide valuable assistance in setting up the needed controls.
- o In summary, procurement and production problems can seriously delay coproduction programs. Overcoming the difficulties of executing contracts in several countries with different laws, languages and business practices is not an easy chore. However, the use of sophisticated scheduling techniques and controls such as those routinely employed by major US contractors should minimize the difficulties.

COPRODUCTION
LL 5

CONFIGURATION MANAGEMENT AND TECHNOLOGY TRANSFER RESPONSIBILITIES
MUST BE DEFINED FOR EACH PARTICIPANT

- o The Army project office should have the ultimate US responsibility for configuration management (CM) and technology transfer. The US contractor should be required to establish a CM system, to validate technical documentation transferred to Europe, and to assure that the documentation is transferred in an orderly fashion.
- o In general, Europe does not practice configuration control and management to the degree practiced in the US. This shortcoming was overcome on the NATO HAWK program by organizing and staffing the MANDATE, a systems engineering organization with specific CM responsibilities. Serious consideration should be given by European NATO members to the establishment of a centralized agency to fulfill configuration management responsibilities for foreign production. Such a centralized agency could validate the technical documents received in Europe and assure their orderly receipt and dissemination.

A CONFIGURATION MANAGEMENT PLAN IS ESSENTIAL TO MAINTAIN
THE INTEGRITY OF THE TECHNICAL DATA PACKAGE

- o A production configuration identification should be established as a baseline against which proposed engineering changes can be evaluated. This should be done prior to the delivery of the first data. The US controls the TDP and furnishes changes to the foreign producers. Agreements between the parties will spell out responsibilities of the foreign producers regarding authority to propose changes and acceptance of US changes.
- o Engineering change orders should be issued judiciously. Limiting changes to those of an essential nature will preserve the integrity of the technical data package and reduce the likelihood of internal inconsistency of the documentation.
- o The complexity of most systems and the myriad of parts and components which make up systems militate against configuration control of all parts and components. Thus, the level at which changes will be controlled must be defined. An economic analysis may assist in identifying those components for which control is most important.
- o The NATO HAWK program developed the categories of interchangeability listed below as an aid in evaluating proposed engineering changes.
 - Complete conformity. An exact replica of the US item which is produced in Europe by a process identical with the one in the US.

COPRODUCTION
LL 6 (Continued)

- Industrial interchangeability. Identical to the US with regard to form, fit and function but made differently.
- Logistical interchangeability. Similar to the US item with regard to form, fit and function but minor differences exist to permit the use of European standard components and test equipment for maintaining the missile. (Note that this definition varies from that for logistic interchangeability in Logistics LL 1).
- Operational and functional interchangeability. Similar to the US item in form, fit and function but with minor differences authorized to permit the use of European standard mechanical components, such as lights and hitches for trailer vehicles.

CHAPTER III
RECOMMENDATIONS

A. Introduction.

An analysis of the programs identified in the study reveals that lessons learned on RSI programs are common or replicable to a significant extent. For example, transfer of technology and the problems of configuration control have plagued cooperative programs for years. Because it is felt that RSI programs are often confronted with similar problems, the conclusion of this research is that the need for a guidance document on RSI lessons learned has been verified. In that light the following recommendations are offered.

B. Recommendations. It is recommended that:

1. A Handbook of Lessons Learned be published and disseminated. The format used in this report and the lessons learned which are included should form the basis for the initial handbook.

2. Responsibilities and procedures for insuring handbook currency should be promulgated in a DA or DARCOM Regulation. This will require a new regulation or the expansion of existing regulations, to cover the RSI Lessons Learned. The regulations should address the following:

a. Responsibilities

(1) DAIR0 should be responsible for the overall policy direction and monitorship of handbook currency.

(2) Deputy Commanding General (DCG) for Materiel Development, HQ DARCOM, should be responsible for promulgating and implementing control procedures for periodic handbook updating.

(3) Assistant Deputy for International Research and Development, HQ DARCOM, should be responsible for the collection, analysis, and dissemination of lessons learned to interested Army activities.

b. Data Sources for Updating Lessons Learned. Among the sources are:

(1) Records of the Project Manager for any projects having interfaces with NATO nations or contractors. Each major organizational element of the PM's Office (e.g., European Field Office, ILS Division) will have useful input.

(2) Minutes of meetings with RSI implications - DSARCs, ASARCs, and Joint Coordinating Committees and Subcommittees for international projects.

(3) Records of negotiations (MOUs, Licensing Agreements, contracts, etc.).

(4) Records of logistic support problems experienced by the Materiel Readiness Commands in supporting RSI weapons systems.

(5) Studies performed by students in major service schools and graduate programs at universities.

3. All future RSI Lessons Learned should be incorporated in the handbook and in the Defense Logistics Studies Information Exchange (DLSIE) data base. The lessons learned to be furnished to DLSIE should be sent to the Commandant, USALMC Logistics Studies Office (LSO), Fort Lee, VA 23801. LSO will insure incorporation of the RSI lessons learned into the document base of the DLSIE and lesson dissemination via the annual and quarterly bibliographies of the DLSIE. (DARCOM-R 795-16 prescribes a similar technique for dissemination of Foreign Military Sales (FMS) Lessons Learned).

APPENDIX A

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABCA	American, British, Canadian, Australian
AMSAA	Army Materiel Systems Analysis Activity
AP	Allied Publications
APC	Armored Personnel Carrier
AQAP	Allied Quality Assurance Publications
AR	Army Regulation
ARRADCOM	US Army Armament Research and Development Command
ARRCOM	US Army Armament Materiel Readiness Command
ASARC	Army Systems Acquisition Review Council
ASBCA	Armed Services Board of Contract Appeals
ASD(ISA)	Office of Assistant Secretary of Defense for International Security Affairs
ASPR	Armed Services Procurement Regulation
BOD	Board of Directors
CAS	Cost Accounting Standards
CDP	Cooperative Development and Production
CER	Cost Estimating Relationship
CG	Comptroller General
CIVR	Configuration Item Verification Review
CLSS	Cooperative Logistic Support System
CM	Configuration Management

APPENDIX A (Con't)

CNAD	Conference of National Armament Directors
COEA	Cost and Operational Effectiveness Analysis
CPIF	Cost Plus Incentive Fee
CPM	Critical Path Method
CRD	Cooperative Research and Development
CTP	Coordinated Test Program
DA	Department of Army
DALO	Office Symbol for DCSLOG
DAMA-PPI	Office Symbol for DCSRDA International Office
DAMI	Office Symbol for Assistant Chief of Staff for Intelligence (ACSI)
DAMO	Office Symbol for DCSOPS
DAR	Defense Acquisition Regulation
DARCOM	US Army Materiel Development and Readiness Command
DASC	Department of Army System Coordinator
DCG	Deputy Commanding General
DCP	Decision Coordinating Paper
DCSLOG	Deputy Chief of Staff for Logistics
DCSOPS	Deputy Chief of Staff for Operations and Plans
DCSRDA	Deputy Chief of Staff for Research, Development, and Acquisition
DEA	Data Exchange Agreement
D&F	Determinations and Findings
DIN	Deutschland Industrial Norms

APPENDIX A (Con't)

DIR/IP	Director, International Programs
DLSIE	Defense Logistics Studies Information Exchange
DOD	Department of Defense
DODD	Department of Defense Directive
DODISS	DOD Index of Specifications and Standards
DRCDE	Office Symbol for Development and Engineering Directorate, HQ DARCOM
DRCGC	Office Symbol for Command Counsel, HQ DARCOM
DSAM	Defense Supply Agency Manual
DSARC	Defense Systems Acquisition Review Council
DSS	Direct Support System
DSU	Direct Support Unit
ECP	Engineering Change Proposal
EPA	Economic Price Adjustment
FMS	Foreign Military Sales
FSTC	Foreign Science and Technology Center
GAO	General Accounting Office
HELIP	HAWK European Limited Improvement Program
HQ	Headquarters
H. R.	House of Representatives
I ²	International Interchangeability
IDL	Indentured Drawing Lists
ILS	Integrated Logistic Support

APPENDIX A (Con't)

ISA	International Security Affairs
ISO	International Standardization Organization
ITAR	International Traffic in Arms Regulation
JCC	Joint Control Committee
LL	Lesson Learned
LOA	Letter of Offer and Acceptance
LSO	Logistics Studies Office
MAS	Military Agency for Standardization
MENS	Mission Element Need Statement
MIL-STD	Military Standard
MIRADCOM	US Army Missile Research and Development Command
MIRCOM	US Army Missile Materiel Readiness Command
MOU	Memorandum of Understanding
MRB	Materials Review Board
NAMSA	NATO Maintenance and Supply Agency
NATO	North Atlantic Treaty Organization
NHMO	NATO HAWK Management Organization
NHPLO	NATO HAWK Production and Logistics Organization
NPC	National Prime Contractor
O&S	Operating and Support
OIRD	Office of International Research and Development, HQ DARCOM

APPENDIX A (Con't)

APPENDIX A (Con't)

SSEB	Source Selection Evaluation Board
STANAG	Standardization Agreements
Stat	Statute
TARADCOM	US Army Tank-Automotive Research and Development Command
TDP	Technical Data Package
TECOM	US Army Test and Evaluation Command
TMDE	Test Measurement and Diagnostic Equipment
TRADOC	US Army Training and Doctrine Command
UCF	Uniform Contract Format
US	United States
USALMC	US Army Logistics Management Center
USAREUR	United States Army Europe
USC	United States Code
USDRE	Under Secretary of Defense for Research and Engineering
USEUCOM	United States European Command
USG	United States Government
WBS	Work Breakdown Structure

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